7. (a) At what angle will X-rays of wavelength 1.542×10^{-10} m undergo second order reflection by planes separated by 3.5×10^{-10}m. 2

(b) Both Nacl and KCl have similar structures. yet their X-ray diffraction patterns are Remarkably different. Why? 2

(c) What are primitive and non-primitive unit cells? Calculate the number of particles per unit cell in each of them. 2

8. (a) Define the Surface tension. Describe any two methods for the determination of Surface tension. 4

(b) The value of $[\alpha]_D^{20}$ for lactose is 55.4°. What is the concentration in grams per litre of a solution of lactose which gives a rotation of 7.24° in a 10 cm cell at 20°C with sodium D light? 2

9. (a) Which type of Crystalline solids have highest melting point and why ? 1

(b) At 20 °C, the density of water is 0.9983 gm^{-3} and its viscosity is 0.010087 poise. Explain how these figures indicate water is an associated liquid. 2

(c) Describe Ostwald's method for determination of Viscosity of the liquid. 2

(d) Why is Cooling caused by evaporation. 1

BSc

Roll No. ..... Total Pages : 4

GSE/D-24 **760**

PHYSICAL CHEMISTRY

Paper–II

Time Allowed : 3 Hours] [Maximum Marks : 32

Note : Attempt **five** questions in all, selecting **two** questions from each Unit. Question No. **1** is compulsory.

Compulsory Question

1. (a) Explain the significance of Van der Waal's constants 'a' and 'b'. 2

(b) Briefly explain the law of Constancy of Interfacial angles. 2

(c) What are the Crystallographic dimensions of their unit cells if some solids belong to the following Crystal systems? 2

(i) Tetragonal (ii) Triclinic.

(d) At what temperature the root mean square velocity of Chlorine gas will be equal to that of SO_2 at NTP ? 2

UNIT–I

2. (a) Define the terms : 3½

(i) Mean tree path.

(ii) Collision number.

(iii) Collision frequency.

Discuss the effect of temperature and pressure on Collision frequency.

(b) Calculate the root mean square velocity, average velocity and most probable velocity of sulphur dioxide molecules at 427°C. ($R = 8.314 \times 10^7$ ergs/deg/mol) 2½

3. (a) Describe Andrew's experiment on critical phenomenon. 3½

(b) The reduced volume and reduced temperature of a gas are 10.2 and 0.7 respectively. What will be its pressure if its critical pressure is 42 atmospheres? 2½

4. (a) Calculate the temperature at which the hydrogen molecules will have an average velocity of 176400 cms^{-1}. 2

($R = 8.314 \times 10^7$ ergs/degree /mol).

(b) Derive expression for critical constants in terms of Van der Waal's constants and hence derive the relationship between them. 4

5. (a) Why do real gases show deviations from ideal behaviour? 1

(b) Derive Van der Waal's equation for real gases. 2½

(c) Calculate the collision frequency of Oxygen molecules at 273K and one atmospheric pressure, given that the molecular diameter of Oxygen molecules is 2×10^{-8} cm. 2½

($R = 8.314 \times 10^7$ ergs k^{-1} mol^{-1})

UNIT–II

6. (a) Define coefficient of Viscosity. Describe briefly the effect of temperature on Viscosity. 2

(b) Calculate the molar refraction of Acetic acid at temperature at which its density is 1.046 cm^{-3}. The experimentally observed value of refractive index at this temperature is 1.3715. 2

(c) What are the factors on which optical rotation depends? Derive an expression for specific rotation. 2

7. निम्नलिखित वस्तुनिष्ठ प्रश्नों के उत्तर दीजिए। 8

(i) कबीर की प्रमुख रचना का नाम लिखिए।

(ii) मीरा की काव्य भाषा कौन सी है।

(iii) घनानंद काव्य की किस धारा से संबंधित कवि है?

(iv) 'मित्र बंधु विनोद' का प्रकाशन कब हुआ?

(v) संदेश रासक किसकी रचना है?

(vi) सिद्धों की संख्या कितने मानी जाती है?

(vii) रस के कितने अंग होते हैं?

(viii) शब्दालंकार किसे कहते हैं?

Roll No. ..... Total Pages : 4

GSE/D-24 704

HINDI (COMPULSORY)

Time Allowed : 3 Hours] [Maximum Marks : 80

नोट : सभी प्रश्न अनिवार्य हैं। दिशा निर्देश अनुसार प्रश्नों के उत्तर दीजिए।

1. निम्नलिखित अवतरणों में से किन्हीं दो की सप्रसंग व्याख्या कीजिए:

(क) अविगत-गति कछु कहत न आवै।

ज्यौं गूँगे मीठे फल को रस अतरगत ही भावै।

परम स्वाद सबही सु निरंतर अमित तोष उपजावै।

मन-बनी कौ अगम-अगोचर, सो जाने जो पावै।

रूप-रेख-गुन-जाति जुगति-बिनु निरालंब कित धावै।

सब विधि अगम बिचारहिं तातै सूर सगुन-पद गावै।

(ख) पदकंजिन मंजू बनीं पनहीं धनुहीं सर पंकज-पानि लिएँ।

लरिका सँग खेलत डोलत हैं सरजू-तट चौहट हाट हिएँ।

तुलसी अस बालक-सों नहिं नेहु कहा जप जोग समाधि किएँ।

नर वे खर सूकर स्वान समान कहौ जगमें फलु कौन जिएँ।

(ग) जोगी मत जा मत जा मत जा, पाइ परूं मैं तेरी चेरी हौं,

प्रेम भगति को पैड़ो न्यारा, हमकूँ गैल बता जा।

अगर चंदन की चिता वणाऊँ, अपने हाथ जला जा।

जल वल भई भस्म की ढेरी, अपरे अंग लगा जा।

मीरां कहे प्रभु गिरधर नागर, जोत में जोत मिला।

(घ) लोक की लाज तजी तवहीं जब देख्यो सखी ब्रजचंद्र सलोनो।

खंजन मीन सरोजन की छवि गंजन नैन लला दिन होनो।।

रसखानि निहारि सकें जु सम्हारि कै को तिय है वह रूप सुठोनो।

भौंह कमान सौं (जोहन) कों सब बेधत प्राननि नंद को छौनो।।

2×6=12

2. कबीरदास का साहित्यिक परिचय दीजिए।

अथवा

विहारी का साहित्यिक परिचय दीजिए। 8

3. निम्नलिखित प्रश्नों में से किन्हीं चार प्रश्नों के उत्तर लगभग 150 शब्दों में दीजिए: 4×4=16

(i) मीरा की भक्ति-भावना का वर्णन कीजिए।

(ii) घनानंद के काव्य को प्रेम का काव्य क्यों कहते हैं?

(iii) कबीर को भाषा का डिक्टेटर क्यों कहते हैं? स्पष्ट कीजिए।

(iv) तुलसीदास के द्वारा चित्रित तत्कालीन समाज का वर्णन कीजिए।

(v) सूरदास के वात्सल्य चित्रण पर प्रकाश डालिए।

(vi) विहार के कला पक्ष को स्पष्ट कीजिए।

4. निम्नलिखित आलोचनात्मक प्रश्नों में से किन्ही दो प्रश्नों के उत्तर दीजिए: 2×8=16

(i) हिंदी साहित्य लेखन की परंपरा पर प्रकाश डालिए।

(ii) आदिकालीन हिंदी साहित्य की परिस्थितियों का वर्णन कीजिए।

(iii) 'रासो' शब्द का अर्थ स्पष्ट करते हुए, रासो काव्य की परंपरा का उल्लेख कीजिए।

(iv) आदिकालीन साहित्य की सामान्य विशेषताओं का वर्णन कीजिए।

5. निम्नलिखित लघुत्तरी प्रश्नों में से किन्ही दो प्रश्नों के उत्तर लगभग 150 शब्दों में दीजिए: 2×5=10

(i) हिंदी साहित्य के इतिहास के आदिकाल के समय सीमा का वर्णन कीजिए।

(ii) हिंदी साहित्य के आदिकाल की साहित्यिक परिस्थितियों का वर्णन कीजिए।

(iii) विद्यापति का संक्षिप्त परिचय दीजिए।

(iv) आदिकालीन के नामकरण पर विचार कीजिए।

6. निम्नलिखित लघुत्तरी प्रश्नों में से किन्ही दो प्रश्नों के उत्तर दीजिए: 2×5=10

(i) काव्य गुण किसे कहते हैं? इसके भेदों का वर्णन कीजिए।

(ii) रस के स्वरूप का वर्णन कीजिए।

(iii) यमक अलंकार की परिभाषा व उदाहरण लिखिए।

(iv) चौपाई छंद की परिभाषा व उदहारण दीजिए।

Roll No. ..... Total Pages : 7

GSE/D-24 762

ENGLISH

Time Allowed : 3 Hours] [Maximum Marks : 40

Note : Attempt **all** the questions.

Read the passage given below and answer the questions that follow :

Let met not the marriage of true minds

admit impediments. Love is not love

Which alters when it alteration finds,

Or bends with the remover to remove.

Questions :

(a) Name the poem and the poet.

(b) What is the poet not prepared to admit?

(c) What happens to true love when there is a chance to change?

(d) Does true love yield before anybody?

(e) Use in sentences of your own :

(i) alter (ii) impediment.

Or

Thus Nature spake – The work was done –

How soon my Lucy's race was run!

She died and left to me

This health, this calm, and quiet scene;

The memory of what has been,

And never more will be.

Questions :

(a) From which poem have these lines been taken?

(b) What does the poem mean by "The work was done"?

(c) What is the meaning of "How soon my Lucy's race was run"?

(d) What did Lucy leave to the poet?

(e) What does the poet think about Lucy? 5

2. Explain with reference to the context :

From rest and sleep, which but they pictures be,

Much pleasure then from thee much more must flow,

And soonest our best men with thee do go,

Rest of their bones and Soul's delivery.

Or

My mother bore me in the southern wild

And I am black, but oh! my soul is white;

White as an angel is the English child;

But I and black, as if bereaved of light. 3

3. Answer the following questions in about 30 words each :

(a) How does Milton regret the loss of his 'light'?

Or

Why should death be not proud of its power?

(b) What makes England a 'Fainting country' for shelly?

Or

What do you undersand by 'City of Palm trees'?

(c) What did Nature decide for Lucy?

Or

Explain : 'The Princes are the dregs of their dull race'.

(d) Why does the poet want to be a Child in 'The Retreat'?

Or

Who was Flecknoe? 6

4. How does the Poet justify the ways of God to man in the sonnet 'On his Blindness'?

Or

Bring out the pathetic condition of England as portrayed in the poem 'England in 1819'. 6

5. Translate the following passage into English :

इस समय राष्ट्रीय एकता और संगठन की हमें बहुत आवश्यकता है। इसी पर हमारी सफलता, प्रगति और समृद्धि निर्भर है। भारत एक विशाल देश है जिसकी जनसंख्या 121 करोड़ के लगभग है। इसमें भिन्न-भिन्न भाषाएँ बोलने वाले लोग रहते हैं जो भिन्न-भिन्न वस्त्र पहनते हैं। इनके धर्म भी अलग-अलग है। इनके रीति-रिवाज भी भिन्न हैं। परन्तु यह सभी भारतीय हैं। दु:ख की बात यह है कि ये लोग प्राय: भाषा और धर्म के आधार पर लड़ते हैं। अपने स्वार्थ को देश प्रेम से ऊँचा रखते है। यह आपस के झगड़े देश को कमजोर करते हैं।

Or

(For Non-Hindi/Foreign candidated only)

Read the following passage and answer the questions given at the end :

Nations become great by self-confidence, not by refying on others. You can be friends with others, but you have to rely on yourselves. There can be co-operation with others, but you have to do your won thinking and work with your own hands. Any country which forgets this and is frightened begins to decline, faces ruin and lowers itself what greater indignity for India that fear should grip us and we lose confidence in ourselves? Whatever work is there, it is we who have to do it, although we have friends in the world and we have to maintain that friendship and take their help. The big countries in the World have helped us and we are grateful for that, not only for the help but for their sympathy. We have to march ahead towards our goal on the path we have closer for ourselves, and we shall attain that goal. We have to remember this principle and insure the progress of the country. Relying on ourselves and with the help of friends, we have to solve our problems and so change our country that it would be able to stand on its legs.

Questions :

(a) How can nations become great?

(b) What happens to a country which loses self confidence?

(c) How can we ensure the progress of our country?

(d) Use in meaningful sentenecs :

Decline; Indignity. 4

6. Write a paragraph on only **one** of the following in about 250 words : 6

(a) Our college library.

(b) Beauties of Nature.

(c) Memories of Childhood.

(d) Noise pollution.

(e) Corruption.

7. (a) Use the following pharsal verbs in your own sentences : 10

(i) Break off (ii) Think over

(iii) Give in.

(b) Fill in the blanks with suitable prepositions :

(i) I do not believe ..... ghosts.

(ii) A gale got up ..... the night, and did much damage.

(iii) It is rude to point ..... people.

(c) Correct the following sentences :

(i) I am Junior to he.

(ii) These pages were writtenn in inks.

(iii) This cloth is inferior with that.

(iv) A Snake cut him.

Roll No. ..... Total Pages : 2

GSE/D-24 774

P.C. SOFTWARE

Paper–II

Time allowed : 3 Hours] [Max. Marks : { B.A. : 25 / B.Sc. : 40 }

Note : Attempt **five** questions in all, selecting **one** question from each unit. Questions No. **1** is compulsory. All questions carry equal marks.

Compulsory Question

1. Attempt all questions:
   (i) Describe the use of control panel in Windows. 2, 2
   (ii) What is role of spell checker in MS Word? 1, 2
   (iii) What is spreadsheet? 1, 2
   (iv) Describe role of F5 button in Power Point. 1, 2

UNIT–I

2. Explain how to configure system devices in Windows? 5, 8
3. (a) What is taskbar in Windows? 2, 4
   (b) What is windows explorer? 3, 4

UNIT–II

4. Write tools used in paragraph formatting in MS Word. 5, 8
5. Explain document dictionary in MS Word. 5, 8

UNIT–III

6. Explain use of sorting and filtering in MS Excel. 5, 8

7. Explain functions performed using page layout in MS Excel. 5, 8

UNIT–IV

8. (a) How to insert WordArt in a slide? 2, 4

   (b) How to insert chart in a slide? 3, 4

9. Explain options available under insert icon in Power Point. 5, 8

(b) Derive an expression for converting z-parameters into ABCD-parameters. 5

9. (a) Show, how 2-two port networks are connected in series-parallel manner and calculate the h-parameters of the overall series-parallel connected network. 5

(b) Derive an expression for converting y-parameters into h-parameters. 5

Roll No. ..... Total Pages : 4

3385

NGSE/D-24

ELECTRONICS

(Electronic Devices and Network Analysis)

Paper : B23-ELE-101

(CC-1/MCC-1/CC-M1)

Time : Three Hours] [Maximum Marks : 50

Note : Attempt *five* questions in all, selecting *one* question from each unit. Question No. 1 is compulsory. All questions carry equal 10 marks.

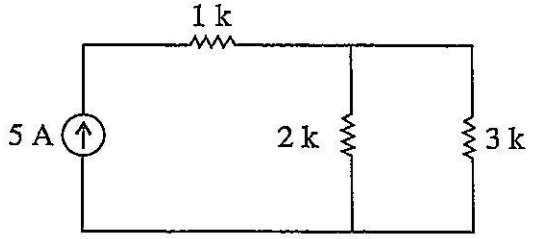
Compulsory Question

1. (a) What is doping in semiconductors? Why is it done?

(b) What do you understand by ripple factor? What is its significance?

(c) Base is always kept very thin and lightly doped. Why?

(d) Find the current in 3 kΩ resistor.



(e) Why h-parameters are known as hybrid parameters? Justify. (2×5=10)

UNIT–I

2. What do you understand by voltage regulation? Explain the working of Zener Diode as voltage regulator with the help of circuit diagram and output plots. 10

3. (a) What is a Rectifier circuit and explain the working of centre-tapped full wave rectifier with the help of circuit diagram and waveforms. 5

(b) Explain the working of shunt negative clipper with the help of circuit diagram and waveforms. 5

UNIT–II

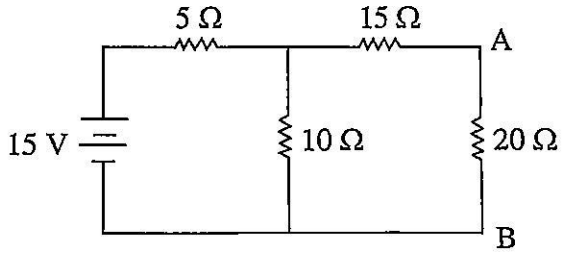
4. Explain the input and output characteristics of transistor in Common Emitter (CE) Configuration. Also show the cut-off, active and saturation regions in the output characteristics. 10

5. (a) What is Early Effect and write its consequences? 5

(b) Drive an expression to show relation between α and β. 5

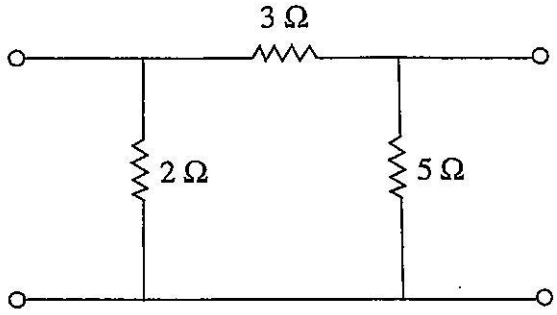
UNIT–III

6. What is Thevnin's theorem? Using Thevnin's theorem, find the current and power consumed across 20 Ω resistor connected across terminals AB in the given circuit. 10



7. (a) What are z-parameters for a 2-port network? Write the z-parameters equations for a 2-port network and define all the z-parameters. 5

(b) Find the z-parameters for the given circuit. 5



UNIT–IV

8. (a) Show, how 2-two port networks are connected in parallel manner and calculate the y-parameters of the overall parallel connected network. 5

Roll No. ..... Total Pages : 3

NGSE/D-24 **3386**

ELECTRONICS
(Basic Digital Electronics)
Paper : B23-ELE-103
(CC-M1)

Time : Three Hours] [Maximum Marks : 20

Note : Attempt *five* questions in all, selecting *one* question from each unit. Question No. 1 is compulsory. All questions carry equal 4 marks.

Compulsory Question

1. (a) Write the equivalent gray code of decimal number 56.

(b) Find 1's and 2's compliment of 1000111.

(c) Implement OR gate using NAND gates.

(d) Convert the Boolean function into its canonical form :

$F(A, B, C) = AB + \overline{B}C + \overline{A}C$. (4×1=4)

UNIT–I

2. (a) Determine the values of P and Q :

(i) $(11110.101)_2 = (P)_{10}$ (ii) $(376)_{10} = (Q)_2$. 2

(b) Convert the following decimal numbers into Hexadecimal system numbers and then from Hexadecimal to binary system numbers :

(i) 8654 (ii) 878. 2

3. (a) Convert the following binary numbers into OCTAL system numbers and then from OCTAL system number into decimal system numbers :

(i) 11110110 (ii) 11111011.100110110. 2

(b) Convert the following decimal numbers into cyclic codes :

(i) 56 (ii) 345.76. 2

UNIT–II

4. Prove the following Boolean Identities :

(i) $A + BC = (A + B)(A + C)$.

(ii) $AB + \overline{A}B + \overline{A}\,\overline{B} = \overline{A} + B$.

(iii) $ABC + \overline{A}BD + A\overline{B}C + AB\overline{C} = AB + BC + CA$.

(iv) $A + \overline{A}B = A + B$. (1×4=4)

5. (a) Prove the following using De-Morgan Laws :

(i) $AB + CD = \overline{\overline{AB}\,\overline{CD}}$.

(ii) $(A + B)(C + D) = \overline{\overline{(A+B)} + \overline{C+D}}$. 3

(b) Define the principle of duality. 1

UNIT–III

6. (a) Implement all basic logic gates using NOR Gates. 2

(b) Make the symbol and truth Exclusive–OR gate? 1

(c) NAND gate and NOR gate are known as universal gates. Why? 1

7. (a) Design the circuit for 3-input OR gate using diodes. Discuss its working and also make its symbol and truth table. 3

(b) What are logic 0 and logic 1 in digital electronics? 1

UNIT–IV

8. What is a K-Map and minimize the given Boolean function using K-Map and realize the minimized expression using NAND gates?

$F(A, B, C, D) = \Sigma m(1, 2, 4, 5, 7, 9, 11) + \phi(3, 6, 13)$. 4

9. What is a K-Map and minimize the given Boolean function using K-Map and realize the minimized expression using NAND gates?

$F(A, B, C, D) = \Sigma m(1, 3, 4, 7, 8, 9, 10, 12, 15) + \phi(0, 11)$. 4

Roll No. .....

Total Pages : 3

3387

NGSE/D-24

PHYSICS

(Mechanics)

Paper : B23-PHY-101

(CC-1/MCC-1)

Time : Three Hours]

[Maximum Marks : 50

Note : Attempt *five* questions. Question No. 1 is compulsory. Attempt *four* more questions selecting *one* question from each unit. The symbol have their usual meaning.

Compulsory Question

1. (a) A solid sphere and a spherical shell each of same mass and radius roll down the same inclined plane. Which one will reach the bottom first ? (2)

(b) Can the value of Poisson's ratio in actual practice be negative ? Explain. (2)

(c) How will the rod moving with speed of light appear to a stationary observer? (2)

(d) Give basic postulates of Einstein special theory of relativity. (2)

(e) What are the characteristics of central force? (2)

UNIT–I

2. (a) State and prove the theorem of parallel axes. (6)

(b) Find the time taken by a solid sphere to roll down an inclined plane 10 m long and having a slope of 1m in 20 m. (4)

3. (a) Define kinetic energy of rotation. Derive an expression between kinetic energy of rotation, moment of inertia and angular velocity. (5)

(b) Derive an expression for the moment of inertia of a solid cylinder about an axis passing its centre and perpendicular to its length. (5)

UNIT–II

4. (a) Show that couple required to twist one end of a wire through a given angle is proportional to the fourth power of the radius. (6)

(b) Define Young's modulus, bulk modulus, coefficient of rigidity. If Y, K and η represent these moduli respectively, prove the relation $Y = \frac{9\eta k}{3k + \eta}$. (4)

5. (a) Derive an expression for the depression of a cantilever at a distance X from the fixed end. (6)

(b) A body of mass 10 kg is suspended at free end of a copper wire 3m long and 1mm in diameter. Calculate the extension and the lateral compression produced in the wire. If Young's modulus of wire is $Y = 1.25 \times 10^{11}\ Nm^{-2}$ and Poisson's ratio is 0.25. (4)

UNIT–III

6. (a) Derive the relation $m = \frac{m_0}{\sqrt{1 - v^2 / c^2}}$ where symbols stand for their usual meaning. (7)

(b) Calculate the velocity at which the mass of a body become double of its mass at rest. (3)

7. (a) Describe Michleson Morley Experiment. Discuss the interpretation of the negative results so obtained with reference to various hypothesis. (8)

(b) What is 'Twin Paradox'? How can it be explained? (2)

UNIT–IV

8. (a) Derive expression for the Gravitational field due at a point :

(i) outside.

(ii) inside.

(iii) on the surface of spherical shell. (5)

(b) Discuss a two body problem reduces into a one body problem. (5)

9. (a) What are Normal mode? Determine normal modes of vibration for a spring mass system using normal coordinate. (5)

(b) Obtain the time period of oscillation of a compound pendulum in the form of an elliptical lamina. (5)

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Total Pages : 3

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NGSE/D-24

PHYSICS

(Elementary Mechanics)

Paper : B23-PHY-103

(CC-M1)

Time : Three Hours]

[Maximum Marks : 20

Note : Question Number 1 is compulsory. Attempt any *five* question selecting atleast one from each unit.

Compulsory Question

1. (a) Define moment of Inertia. Give its Physical Significance.

(b) Prove that extensional and compressional stress are equal.

(c) Calculate the percentage decrease in the volume of a cube of side L moving along x axis with velocity 0.9c.

(d) What is Gravitational Potential?

(e) Define normal coordinate and normal modes.

UNIT–I

2. Derive an expression for moment of Inertia due to metallic disc of mass 'm' and radius 'R' about (a) an axis passing through center and perpendicular to plane and (b). about any diameter

3. (a) Discuss radius of Gyration and center of mass in detail.

(b) The moment of Inertia of a body about a line AB is 120 g. cm^2. Calculate its moment of inertia about another line CD which is 5 cm away from line AB in same direction.

UNIT–II

4. Explain twisting of a solid cylinder and derive an expression for torque required to twist a cylinder.

5. Define Hooke's Law and Modulus of elasticity. Discuss their type.

UNIT–III

6. (a) Derive the Relation $m = \frac{m_0}{\sqrt{1-\frac{v^2}{c^2}}}$

(b) Calculate the velocity of a body if its kinetic energy is equal to rest mass energy.

7. (a) What are the postulates of special theory of relativity?

(b) Discuss Lorentz Length contraction.

UNIT–IV

8. Discuss the motion of two identical simple pendulum coupled with spring and derive expression for the frequencies.

9. What is gravitational potential? Derive an expression for gravitational Potential due to a solid and hollow Sphere.

Roll No. .....

Total Pages : 3

NGSE/D-24

3395

MATHEMATICS

(Calculus)

Paper : B23-MAT-101

(CC-1/MCC-1)

Time : Three Hours]

[Maximum Marks : 50

Note : Attempt *five* questions in all, selecting *one* question from each Section. Question No. 9 is compulsory. Each question carry equal marks.

SECTION–I

1. (a) Show that the given function

$$f(x)=\begin{cases} x^3 \sin\frac{1}{x}, & \text{if } x \neq 0 \\ 0\ , & \text{if } x=0 \end{cases}$$

is continuous as well as differentiable at 0.

(b) Using L'Hospital rule, Evaluate

$$\lim_{x\to 1}(1-x^2)^{\frac{1}{\log(1-x)}}.$$

2. (a) If $x = \sin\left(\frac{\log y}{a}\right)$, prove that

$(1 - x^2)y_{n+2} - (2n + 1)xy_{n+1} - (n^2 + a^2)y_n = 0$.

Also find $y_n(0)$.

(b) Expand $\log(1 + \sin^2 x)$ in powers of x as far as terms

containing x^4.

SECTION–II

3. (a) Show that for the curve $y = \log_e x$ the least value of $|\rho|$ is $\frac{3\sqrt{3}}{2}$.

(b) Find the equation of cubic which has the same asymptotes as the curve

$$x^3 - 6x^2y + 11xy^2 - 6y^2 + x + y + 4 = 0$$

and which passes through (0, 0); (2, 0) and (0, 2).

4. (a) Find the asymptotes of the curve $r \cos \theta = a \cos 2\theta$.

(b) If ρ_1 and ρ_2 are the radii of curvature at the extremities of any chord through the pole of the cardioid $r = a(1 - \cos \theta)$, then show that $\rho_1^2 + \rho_2^2 = \frac{16a^2}{9}$.

SECTION–III

5. (a) Find the position and nature of double points on the curve $x^3 - y^2 - 7x^2 + 4y + 15x - 13 = 0$.

(b) Find the range of values of x for which the curve $y = x^4 - 6x^3 + 12x^2 + 5x + 7$ is concave or convex upwards. Also determine the points of inflexion.

6. (a) Obtain a reduction formula for $\int x^n \cos x \, dx$ and hence evaluate $\int x^3 \cos x \, dx$.

(b) Obtain a reduction formula for $\int (x^2 + a^2)^{n/2} \, dx$ and

hence evaluate $\int (x^2 + a^2)^{5/2} \, dx$.

SECTION–IV

7. (a) Find the length of complete cycloid given by $x = a(\theta - \sin \theta)$; $y = a(1 - \cos \theta)$.

(b) Find the intrinsic equation of the curve

$$y = a \log \sec \left(\frac{x}{a}\right),$$

s being measured from the origin.

8. (a) Find the area bounded by the parabola $x^2 = 8y$ and the line $x - 2y + 8 = 0$.

(b) Find the volume of a spherical cap of height h cut off from a sphere of radius a.

Compulsory Question

9. (a) Find the n^{th} derivative of $\frac{1}{3x+2}$.

(b) Find the Maclaurin's expansion of $\log(1 - x)$.

(c) Find the asymptotes (if any), parallel to coordinate axes for the curve $y = e^{-x^2}$.

(d) Evaluate $\int_0^{\pi/2} \sin^5 x \cos^6 x \, dx$.

(e) Find the length of the arc of the curve $y = \log \sec x$ from $x = 0$ to $x = \frac{\pi}{3}$.

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Total Pages : 3

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NGSE/D-24

COMPUTER SCIENCE

(Problem Solving through-C)

Paper–B23-CSE-101

(CC-1/MCC-1)

Time : Three Hours] [Maximum Marks : 50

Note : (i) All questions carry equal marks.

(ii) Attempt *five* questions by selecting *one* question from each unit.

(iii) Question number 1 is compulsory for all.

Compulsory Question

1. Define following terms with suitable examples for each.

(a) Symbolic Constant.

(b) Address (&) Operator.

(c) Value of (*) Operator.

(d) Break statement.

(e) Format Specifiers. (5×2=10)

UNIT–I

2. Why C is also called middle level language? Explain the structure, elements and features of C language in detail. (10)

3. Differentiate between following :

(a) Constant Vs Variable. (3)

(b) getch() Vs getche() Vs getchar(). (4)

(c) putch() Vs puts() Vs putchar(). (3)

UNIT–II

4. (a) What do you mean by type casting? How type conversion is implemented in C language? Explain both implicit and explicit type conversions with examples. (5)

(b) Write a program to find the roots of quadratic equation. (5)

5. Explain following control structures in detail.

(a) Else-If Ladder. (4)

(b) While do. (3)

(c) For Loop. (3)

UNIT–III

6. What do you mean by parameter passing in a function? Explain in detail the various types of parameter passing techniques in C language. Give example for each. (10)

7. (a) Define Array alongwith its types. Explain the concept of array of strings in detail. (5)

(b) Write a program to find sum of two matrices. (5)

UNIT–IV

8. (a) Differentiate Between following :

(i) Union *Vs.* Structures.

(ii) Arrays *Vs.* Structures. (3×2=6)

(b) Define and implement array using Pointers. (4)

9. (a) What is the need of pointers in a program? Does pointer increases or decreases complexity of program? Explain and give example in the support of your answer. (4)

(b) Explain the advantages and disadvantages of using pointers in C program. (3)

(c) Write a program to swap two numbers. (3)

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Total Pages : 3

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NGSE/D-24

COMPUTER SCIENCE

(Basic IT Tools)

Paper : B23-SEC-103

Time : Three Hours]

[Maximum Marks : 35

Note : Question No. 1 is compulsory. In addition, attempt *four* more questions, selecting *one* question from each unit. All questions carry equal marks.

नोट : प्रश्न संख्या 1 अनिवार्य है। इसके अतिरिक्त, प्रत्येक इकाई से **एक** प्रश्न चुनकर चार और प्रश्नों का उत्तर दें। सभी प्रश्नों के अंक समान हैं।

1. (a) Google.

(b) What is Smartphone?

(c) Full Form of WAN.

(d) Whatsapp.

(e) Desktop.

(f) Full form of ALU and CPU.

(g) Pen Drive. (1×7=7)

(क) गूगल।

(ख) स्मार्टफोन क्या है?

(ग) WAN का पूरा नाम।

(घ) व्हाट्सएप।

(ङ) ALU और CPU का पूर्ण रूप।

(च) पेन ड्राइव।

UNIT–I (इकाई–I)

2. Draw a block diagram of Computer system and explain the various component of computer. 7
कंप्यूटर सिस्टम का एक ब्लॉक आरेख बनाएं और कंप्यूटर के विभिन्न घटकों की व्याख्या करें।

3. Explain Hardware and Software with example. 7
हार्डवेयर और सॉफ्टवेयर को उदाहरण के साथ समझाइएं।

UNIT–II (इकाई–II)

4. What is an operating system? What are the primary functions of an operating system? 7
ऑपरेटिंग सिस्टम क्या है? ऑपरेटिंग सिस्टम के प्राथमिक कार्य क्या हैं?

5. What is the purpose of file and folder management? How can you effectively manage files and folders within an operating system? Explain common file and folder management tasks. 7
फ़ाइल और फ़ोल्डर प्रबंधन का उद्देश्य क्या है? आप ऑपरेटिंग सिस्टम के भीतर फाइलों और फोल्डरों को प्रभावी ढंग से कैसे प्रबंधित कर सकते हैं? सामान्य फ़ाइल और फ़ोल्डर प्रबंधन कार्यों की व्याख्या करें।

UNIT–III (इकाई–III)

6. What is the Internet? Explain any *five* applications of Internet. 7
इंटरनेट क्या है? इंटरनेट के किन्हीं **पाँच** अनुप्रयोगों को स्पष्ट कीजिए।

7. Describe different network topologies commonly used in computer networks. Which topology is better and why? 7
नेटवर्किंग में आमतौर पर प्रयुक्त विभिन्न नेटवर्क टोपोलॉजी का वर्णन करें। कौन-सी टोपोलॉजी बेहतर है और क्यों?

UNIT–IV (इकाई–IV)

8. What is Email? Explain the steps involved in opening an e-mail account. What information is typically required during the registration process? What are the key components of an e-mail mailbox, including the Inbox and Outbox? 7
ईमेल क्या है? एक ईमेल खाता खोलने के लिए आवश्यक कदम कैसे समझाएं। पंजीकरण प्रक्रिया के दौरान सामान्य रूप से किस प्रकार की जानकारी की आवश्यकता होती है? ईमेल मेलबॉक्स के मुख्य घटक क्या हैं, जैसे कि इनबॉक्स और आउटबॉक्स?

9. Describe the major social networking platforms like Facebook, Twitter, LinkedIn, and Instagram. 7
मुख्य सोशल नेटवर्किंग प्लेटफ़ॉर्म्स जैसे कि फेसबुक, ट्विटर, लिंक्डइन, और इंस्टाग्राम का वर्णन करें।

UNIT–IV (इकाई–IV)

8. Explain concept, types and factors affecting on learning. (10)

सीखने को प्रभावित करने वाली अवधारणा, प्रकार और कारकों की व्याख्या कीजिए।

9. (a) Discuss measurement of intelligence. (5)

बुद्धि के मापन पर चर्चा कीजिए।

(b) Write concept and factors affecting of intelligence. (5)

बुद्धि की अवधारणा एवं प्रभावित करने वाले कारक लिखिए।

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NGSE/D–24

HOME SCIENCE

(Introduction to Human Development)

Paper–B23-HSC–103

(CC–C1)

Time : 3 Hours] [Maximum Marks : 50

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. Question No.**1** is compulsory. All questions carry equal marks.

नोट : प्रत्येक इकाई से कम से कम **एक** प्रश्न का चयन करते हुए, कुल **पाँच** प्रश्नों के उत्तर दीजिए। प्रश्न संख्या **1** अनिवार्य है। सभी प्रश्नों के अंक समान हैं।

Compulsory Question (अनिवार्य प्रश्न)

1. Write short notes on the following : (2×5=10)

निम्नलिखित पर संक्षिप्त नोट लिखिए :

(a) Define Growth.

विकास को परिभाषित कीजिए।

(b) What is Case Study?

केस स्टडी क्या है?

(c) Write types of Learning.

सीखने के प्रकार लिखिए।

(d) What do you mean by Observation?

अवलोकन से आपका क्या तात्पर्य है?

(e) Write different stages of Human Development.

मानव विकास के विभिन्न चरण लिखिए।

UNIT–I (इकाई–I)

2. (a) Write importance and scope of human development. (5)

मानव विकास का महत्व एवं दायरा लिखिए।

(b) Explain the principles of Human Development. (5)

मानव विकास के सिद्धांतों की व्याख्या कीजिए।

3. (a) Discuss factors influencing growth and development. (5)

वृद्धि और विकास को प्रभावित करने वाले कारकों पर चर्चा कीजिए।

(b) What are the differences between Growth and Development? (5)

वृद्धि और विकास में क्या अंतर हैं?

UNIT–II (इकाई–II)

4. (a) Explain Psychoanalytic theory of Sigmund Freud. (5)

सिगमंड फ्रायड के मनोविश्लेषणात्मक सिद्धांत की व्याख्या कीजिए।

(b) Discuss cognitive theory of Piaget. (5)

पियाजे के संज्ञानात्मक सिद्धांत की चर्चा कीजिए।

5. Explain stages and domains of human development throughout life span. (10)

मानव विकास के पूरे जीवन काल में उसके चरणों और क्षेत्रों की व्याख्या कीजिए।

UNIT–III (इकाई–III)

6. (a) Write social and moral developmental tasks during life span of human development. (5)

मानव विकास के जीवन काल के दौरान सामाजिक एवं नैतिक विकासात्मक कार्य लिखिए।

(b) Explain Cognitive and language developmental tasks during life span of human development. (5)

मानव विकास के जीवन काल के दौरान संज्ञानात्मक और भाषा विकासात्मक कार्यों की व्याख्या कीजिए।

7. Write notes on :

नोट लिखिए :

(a) Cross-sectional and longitudinal method. (5)

क्रॉस-अनुभागीय और अनुदैर्घ्य विधि।

(b) Method of collecting data in human studies. (5)

मानव अध्ययय में डेटा एकत्र करने की विधि।

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NGSE/D-24

FUNDAMENTAL OF CLOTHING AND TEXTILE

Paper : B23-HSC-102

(CC-B1)

Time : Three Hours] [Maximum Marks : 50

Note : Attempt any *five* questions in all, selecting at least *one* question from each unit along with compulsory question.

नोट : प्रत्येक इकाई से कम से कम **एक** प्रश्न का चयन करते हुए, अनिवार्य प्रश्न सहित कुल **पाँच** प्रश्नों के उत्तर दीजिए।

(Compulsory Question)

(अनिवार्य प्रश्न)

1. Write short notes on the following :

निम्नलिखित पर संक्षिप्त नोट्स लिखें :

(a) Homemade garments.

घर का बना कपड़ा ।

(b) Bias grain line.

पूर्वाग्रह अनाज लाइन ।

(c) Darts.

डार्ट।

(d) Tensile strength.

तन्यता ताकत।

(e) Contours.

आकृति।

UNIT–I (इकाई–I)

2. Throw light on defects of sewing machine and their adjustments.

   सिलाई मशीन के दोष एवं उनके समायोजन पर प्रकाश डालिए।

3. Explain the function of different parts of sewing machine with diagram.

   सिलाई मशीन के विभिन्न भागों के कार्य को चित्र सहित समझाइये।

UNIT–II (इकाई–II)

4. Write the difference between taylormade and readymade garments? Explain with examples.

   टेलरमेड और रेडीमेड कपड़ों के बीच अंतर लिखें? उदाहरण सहित समझाइये।

5. Write a detailed note on clothing requirements of lactating mother?

   स्तनपान कराने वाली माँ के कपड़ों की आवश्यकताओं पर एक विस्तृत नोट लिखें।

UNIT–III (इकाई–III)

6. Write the definition and classification of fibre in detail.

   फाइबर की परिभाषा एवं वर्गीकरण को विस्तार से लिखिए।

7. Write the manufacturing process of rayon fibre with proper illustration.

   रेयान फाइबर की निर्माण प्रक्रिया को उचित चित्रण के साथ लिखिए।

UNIT–IV (इकाई–IV)

8. Define yarn. Explain the process of yarn making (s twist and z twist).

   सूत को परिभाषित करें। सूत बनाने की प्रक्रिया (एस ट्विस्ट और जेड ट्विस्ट) समझाइए।

9. What are the basic principles of yarn making? Explain in detail.

   सूत बनाने के मूल सिद्धांत क्या हैं? विस्तार से व्याख्या करें।

(b) Define viscosity and refractive index. (3)

(c) Discuss various types of Van der Waals forces with examples. (3)

9. (a) Define the terms : centre of symmetry, plane of symmetry and axis of proper rotation. (4)

(b) Write a short note on isomorphism and polymorphism. (3)

(c) Why do NaCl and KCl have different diffraction patterns? (3)

Roll No. ..... Total Pages : 4

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NGSE/D-24

CHEMISTRY

(Chemistry-I)

Paper–B23-CHE-101

(CC-1/MCC-1)

Time : Three Hours] [Maximum Marks : 50

Note : All questions carry equal marks. The candidate is required to attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is compulsory. Log table and nonprogrammable calculator is allowed.

Compulsory Question

1. (a) What is $(n + l)$ rule? Give *two* examples. (2)

(b) Explain why successive electron affinities have negative values? (2)

(c) What are real gases? Why do they deviate from the ideal behaviour? (2)

(d) Explain different types of Inductive Effect. (2)

(e) What is the effect of temperature on surface tension and viscosity? (2)

SECTION–I

2. (a) What do you mean by Slater's rule? Calculate the effective nuclear charge at the periphery of the chromium atom. (Where At. No. of Cr = 24). (4)

(b) Draw the radial probability distribution curves for : (i) $n = 3$, $l = 0$ (ii) $n = 4$, $l = 2$. (3)

(c) Calculate the momentum of a particle which has a de-Broglie wavelength of 1 nm. (Where $h = 6.626 \times 10^{-34}$ kg m^2 s^{-1}) (3)

3. (a) Explain :

(i) Why chlorine has unexpectedly higher electron affinity than that of fluorine?

(ii) Why are electron affinities of noble gases zero? (4)

(b) What are isoelectronic ions? Compare the sizes of N^{3-}, O^{2-}, F^-, Na^+, Mg^{2+} and Al^{3+} ions. (3)

(c) What do you mean by electronegativity? Discuss various factors which affect electronegativity. (3)

SECTION–II

4. (a) Define root mean square velocity, most probable velocity and average velocity with their mathematical expressions. (4)

(b) Show diagrammatically, the effect of temperature on Maxwell distribution of speeds. (3)

(c) What are the differences between ideal and non-ideal gases? (3)

5. (a) Define the terms collision diameter, collision number and collision frequency with their mathematical expressions. (4)

(b) What are important features of Maxwell's distribution curve? (3)

(c) Explain the significance of Van der Waal' constants 'a' and 'b'. (3)

SECTION–III

6. (a) Explain the relative stabilities of alkyl carbocations with inductive and hyperconjugation effects. (4)

(b) What is the difference between resonance effect and inductive effect? (3)

(c) Discuss the hybridization and basic structures of carbanions and carbenes. (3)

7. (a) Define various types of substitution reactions with examples. (4)

(b) Define electrophile and nucleophile with examples. (3)

(c) Discuss the hybridization and basic structures of Carbocation and free radicals. (3)

SECTION–IV

8. (a) Calculate the molar refractivity of acetic acid (CH_3COOH) at a temperature at which its density is 1.046 gm/cm^3. The experimental observed value of refractive index at this temperature is 1.3715. (4)

Roll No. .....

Total Pages : 3

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NGSE/D-24

CHEMISTRY

(Minor Chemistry–I)

Paper : B23-CHE-103

(CC-M1)

Time : Two Hours]

[Maximum Marks : 20

Note : Attempt *four* questions selecting one question from each Unit. Question No. 1 is compulsory.

Compulsory Question

1. (a) What is bond angle in SP hybridization?

(b) What is unit of rate constant of zero order reaction?

(c) Define isomerism with example.

(d) What is effect of temperature on conductivity of semiconductor? (1×4=4)

UNIT–I

2. (a) Explain shape of NH_3 and H_2O molecule as per VSEPR (valence shell electron pair repulsion) Theory. (2)

(b) Explain shape and hybridization of $CH_2=CH_2$ (Ethene). (2)

3. (a) What is sp^2 hybridization? Explain with atleast one example. (2)

(b) Explain Valence shell electron pair repulsion (VSEPR) theory. (2)

UNIT–II

4. (a) What is difference between order & molecularity of a reaction? (2)

(b) Give expression for integrated rate for zero order & first order reaction. (1,1)

5. (a) What is average rate of reaction and instantaneous rate of reaction? (2)

(b) How reaction rate is affected by a catalyst? (2)

UNIT–III

6. (a) Give IUPAC name of

(i) $CH_3—\underset{\displaystyle CH_3}{\underset{|}{CH}}—CH_3$

(ii) $CH_3—CH_2—CH_2—\ CH_2—CH_3$. (1,1)

(b) Write down any one method of preparation of alkane and Corey-House reaction. (1,1)

7. What is isomerism? Write down isomers of C_5H_{12}. (4)

UNIT–IV

8. (a) What is band theory of semiconductors? (3)

(b) What is Conductivity of semiconductor at absolute zero temperature. (1)

9. Define following terms :

(a) Valence band.

(b) Conduction band.

(c) Insulator.

(d) Conductor. (4)

(b) Using principle of mathematical induction, prove that $(2^{2n} - 1)$ is divisible by 3. (4)

7. (a) How many integers between 1 and 60 are divisible by at least one of 2, 3 and 5? (4)

(b) If A and B be any two sets, than prove

(i) $A - B = A - (A \cap B)$.

(ii) $B - A^c = B \cap A$. (4)

UNIT–IV

8. (a) Let R be the relation defined on set of integers $\mathbb{Z}$ such that

$m, n \in \mathbb{Z}, m \, R \, n \Leftrightarrow 4$ divides $(m - n + 8)$.

Show that R is an equvalence relation. (4)

(b) Find domain and range of following functions :

(i) $y = \sqrt{\ln x}$.

(ii) $y = 4 \tan x \cos x$. (4)

9. (a) Show that divisibility relation in the set of positive integers is reflexive and transitive, but not symmetric. (4)

(b) Let p, q and r be three propositions, then show that $(p \vee q) \vee r \Leftrightarrow p \vee (q \vee r)$. (4)

Roll No. ..... Total Pages : 4

BSIT/D-24 **26310**

MATHEMATICAL FOUNDATION FOR INFORMATION TECHNOLOGY–I

Paper : BSIT-102

Time : Three Hours] [Maximum Marks : 40

Note : Attempt *five* questions in all, selecting *one* question from each unit. Question No. 1 is compulsory.

Compulsory Question

1. (a) Find the eigen values and corresponding eigen vectors of matrix $A = \begin{bmatrix} 2 & 1 \\ 2 & 3 \end{bmatrix}$. (2)

(b) Find the differential equation of system of circles touching y-axis at origin. (2)

(c) Let $U = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$,

$A = \{x \in U : x$ is a multiple of $3\}$,

$B = \{x \in U : x^2 - 5 \geq 0\}$.

Determine :

(i) $A \cup B$.

(ii) $A - B$. (2)

(d) Let R be a relation on set of natural number $\mathbb{N}$ defined by x R y if x and y share a common factor other than 1. Determine the reflexivity and transitivity of R. (2)

UNIT–I

2. (a) Find the rank of the matrix

$$\begin{bmatrix} 1 & 3 & 4 & -2 \\ 2 & 6 & 8 & -4 \\ 3 & 0 & 3 & 3 \end{bmatrix}. \quad (4)$$

(b) Determine the eigen values and corresponding eigen vectors of the following matrix ;

$$\begin{bmatrix} -3 & -9 & -12 \\ 1 & 3 & 4 \\ 0 & 0 & 1 \end{bmatrix}. \quad (4)$$

3. (a) Prove that the matrix

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 5 & -3 & 3 \\ 1 & 0 & -2 \end{bmatrix}.$$

Satisfies its characteristic equation. Hence find A^{-1}. (4)

(b) Diagonalize, if possible

$$A = \begin{bmatrix} 6 & 0 & 0 \\ 0 & 7 & -4 \\ 9 & 1 & 3 \end{bmatrix}. \quad (4)$$

UNIT–II

4. (a) Solve the differential equation

$$(2x + y + 1)dx + (4x + 2y - 1)dy = 0. \quad (4)$$

(b) Solve the differential equation

$$(x^2 + y^2 + x)dx + xydy = 0. \quad (4)$$

5. (a) Solve the differential equation

$$\frac{d^2y}{dx^2} + \frac{dy}{dx} - 2y = x + \sin x. \quad (4)$$

(b) Solve the differential equation

$$x^3\frac{d^3y}{dx^3} + 2x^2\frac{d^2y}{dx^2} + 2y = 10\left(x + \frac{1}{x}\right). \quad (4)$$

UNIT–III

6. (a) In a survey conducted in a town of 2000 population to see the readership of newspaper, it has revealed that 1000 read Hindustan Times, 800 read Times of India and 700 read Indian Express. If there are 300 who read both Times of India and Indian Express, 400 who read Hindustan Times and Times of India, 500 read only Hindustan Times and 100 read all the three papers. Then, find

(i) How many read both Hindustan Times and Indian Express?

(ii) How many of them read only one paper?

(iii) How many of them read none of the papers? (4)

Roll No. ..... Total Pages : 3

BSIT/D-24 **26311**

FUNDAMENTAL OF EM WAVES

Paper : BSIT-103

Time : Three Hours] [Maximum Marks : 40

Note : Attempt *five* questions in all, selecting *one* question from each unit. Question No. 1 is compulsory.

Compulsory Question

1. (a) Prove that $\nabla.(\vec{A}+\vec{B}) = \nabla.\vec{A}+\nabla.\vec{B}$. 2

(b) Explain transverse nature of electromagnetic waves. 2

(c) A coil has an inductance of $\frac{4}{\pi}$ henry and joined in series with a resistance of 30 Ω. Calculate the current flowing in the circuit when connected to a.c. mains of 220 volt and frequency 50 Hz. 2

(d) Write down the losses in transmission line. 2

UNIT–I

2. (a) State and prove Stoke's theorem. Discuss its significance. 5

(b) Prove that the divergence of curl of $\vec{V}$ is zero. 3

3. (a) Distinguish between the scalar and vector potentials as applied in magnetism. Derive expression for vector potential $\vec{A}$ and current density $\vec{J}$, i.e.,

$$\nabla^2 \vec{A} = -\mu_0 \vec{J}.$$ 5

(b) State and prove Gauss's law in electrostatics. 3

UNIT–II

4. (a) Derive Maxwell's electromagnetic equations in the differential and integral form. 5

(b) Explain the skin effect. 3

5. What do you mean by Poynting Vector? Derive Poynting fs theorem for the conservation of energy in an electromagnetic field and discuss the physical meaning of each term in the resulting equation. 8

UNIT–III

6. Calculate the impedance of a series LCR circuit and deduce the conditions at which resonance takes place. Calculate the resonance frequency. Also discuss under which condition the circuit behaves as capacitive and inductive. Explain the quality factor of an LCR circuit with physical significance. 8

7. (a) Derive expression for the relation between the e.m.f. and current in a circuit consisting of (i) pure resistance only and (ii) pure inductance only. 5

(b) Calculate the capacitance of a capacitor to run a 30 volt, 10 watt lamp, when connected in series to an alternating e.m.f. of 220 volt at 50 Hz. 3

UNIT–IV

8. (a) Explain the input impedance of open circuit and short circuit lines. Discuss how quarter wave and half wave lines act as circuit element. 5

(b) Describe the reactance properties of a transmission line. 3

9. (a) What do you mean by transmission line? Explain the propagation constant, attenuation constant, phase constant and characteristic impedance of a transmission line. 5

(b) Calculate the characteristic impedance and velocity of propagation at 400 kilo-cycles/second for a transmission line having L = 0.5 mH/km, C = 0.08 μH and negligible R and G. 3

Roll No. ..... Total Pages : 2

26314

BSIT/D-24

COMPUTER FUNDAMENTALS–I

Paper–BSIT-106

Time : Three Hours] [Maximum Marks : 40

Note : Attempt *five* questions in all. Question No. 1 is compulsory and attempt *one* question from each unit. All questions carry equal marks.

Compulsory Question

1. (a) Explain any *two* major output devices in detail. (2)

(b) What is Bubble memory? (2)

(c) What is middleware? (2)

(d) Explain difference between Save and Save as. (2)

UNIT–I

2. What is Computer? Explain various types of computers in details. (8)

3. Explain the process of creating, renaming and deleting a file and folder in any operating system. (8)

UNIT–II

4. Explain any *one* sequential access device in details and its advantages and disadvantages. (8)

5. (a) Write a note on Magnetic Disk and its working in details. (6)

   (b) What is charge coupled device? (2)

UNIT–III

6. What is Software? Explain various steps of software development. (8)

7. What is system software? Explain various types of system software. (8)

UNIT–IV

8. What is operating system with example? Explain main features of any GUI based operating system in details. (8)

9. Explain the process of spelling check in MS-Word. Also explain the process of creating and using a macro in MS-Word. (8)

Roll No. ..... Total Pages : 2

26322

BSIT/D-24

PROGRAMMING IN C++ (I)

Paper : B.Sc. IT-502

Time : Three Hours] [Maximum Marks : 40

Note : Attempt *five* questions in all, selecting *one* question from each unit. Question No. 1 is compulsory. All questions carry equal marks.

Compulsory Question

1. (i) Write structure of C++.
   (ii) What are string functions, discuss any *three*.
   (iii) Give example of Structure and Union and differentiate them.

UNIT–I

2. Explain various types of operators used in C++ with example.

3. Discuss various Loops available in C++ with concept of nesting also. Explain concept of Nesting using a program to Find Factorial from 2 to 7.

UNIT–II

4. Explain concept of 2-D array in C++. Take example of Matrix Addition.

5. (a) Explain use of Pointers in C++.
   (b) How pointers are used in Swapping two variables.

UNIT–III

6. Explain inline function and free storage allocation.

7. Explain concept of Function overloading with a program.

UNIT–IV

8. Discuss use of Class, member function, scope of class using an example.

9. Explain concept of Constructors and their types. Also discuss in brief usage of Destructor.

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26338

NBSIT/D-24

INFORMATION TECHNOLOGY

Digital Electronics-I

Paper : B23-HIT-101

(CC-1/MCC-A1)

Time : Three Hours] [Maximum Marks : 50

Note : Question No. 1 is compulsory. Attempt *one* question from Unit-I to IV.

Compulsory Question

1. (a) Convert $(F4BA)_{16}$ to octal code.

(b) Differentiate between Combinational and sequential circuits.

(c) Draw the circuit of Full adder using two half adders.

(d) What shortcomings does an SR flip-flop possess? State the need for preset and clear inputs of flip flops.

(e) Draw the logic diagram for the logic function $Z = (AB + B'C + C'). D'$. (5×2=10)

UNIT–I

2. (a) Divide binary number 1101101.1001 and 1001. 2

(b) Convert the following :

(i) (101011) binary into octal.

(ii) 7654 octal into Hexadecimal.

(iii) AB7F, DC hexadecimal into binary. 3

(c) Subtract using 2's and 1's complement (48-65). 3

(d) Enlist the advantages and uses of Gray codes. 2

3. (a) Convert (11111011) Binary into Gray Code and 657 decimal into Excess-3. 3

(b) Multiply 110111 binary with 1011 Binary. 2

(c) Solve $(477)_8 = (\text{------})_{10}$ and $(BBF)_{16}$ into $(\text{-----})_8$. 3

(d) Find the 1's and 2's complement of 1011010101 and 111001001. 2

UNIT–II

4. (a) Explain the working of AND & OR gates with truth tables. Also draw the internal circuits of these gates. 5

(b) Explain the working of DTL NAND gate with suitable circuit. 5

5. (a) Simplify the following Boolean expression and draw the circuit using NAND – NAND logic :
$F(v, w, x, y) = \Sigma m(0,1,2,3,5,7,9,11,14,15).d(4,13)$. 6

(b) Explain the operation of master-slave JK flip flop with neat sketch. 4

UNIT–III

6. (a) Explain the working of 4 bit binary parallel Adder using Full adders. 5

(b) Design a combinational logic circuit with four inputs that will produce logic one output when minimum two inputs variables are logic 1. 5

7. (a) Implement the following expression using single 8 : 1 MUX :

$F = \Sigma m(0,1,5,7,8,9,12,13,14,15)$. 5

(b) Design a 3 bit Binary to Gray code converter. 5

UNIT–IV

8. (a) Explain the operation of level clocked D flip flop with circuit diagram and truth table. 5

(b) Convert J-K flip into T Flip Flop. 5

9. (a) What do you mean by Race around Condition? How is it eliminated? 4

(b) What is excitation table? How is it different from Truth Table? Draw the excitation table for all the flip Flops. 6

Roll No. ..... Total Pages : 2

26339

NBSIT/D-24

INFORMATION TECHNOLOGY

(Computer and Programming Fundamentals)

Paper : B23-HIT-102

(CC-2/MCC-A2)

Time : Three Hours] [Maximum Marks : 50

Note : Attempt *five* question in all by selecting *one* question from each Unit. Question No. 1 is compulsory. All questions carry equal marks.

Compulsory Question

1. Write short notes on the following :

(a) Integrated Circuits.

(b) CD.

(c) Pseudo code.

(d) Machine language.

UNIT–I

2. Explain the evolution and generations of computers along with their characteristics.

3. (a) What do you mean by output devices? Explain three of them in detail.

(b) What is software? How is it related with hardware.

UNIT–II

4. Explain the following :
   Cache Memory, CPU Registers, Flash Memory.

5. Differentiate the following :
   (a) RAM & ROM.
   (b) Sequential & Direct access.

UNIT–III

6. What is problem solving? How is it achieved with different techniques? Explain flowchart and algorithm using suitable examples.

7. (a) What do you mean by decision table? Explain it for a User Login scenario in detail with username and password as two inputs.
   (b) What are top-down and bottom-up programming methodologies?

UNIT–IV

8. Why we need searching and sorting in computer problem solving? Explain linear search and insertion sort using suitable examples.

9. What are assembly language programmes? How are they different other high level language programmes? Explain.

Unit IV (इकाई IV)

8. Write short notes on the following : 2×4=8

(a) Principles of cooking

(b) Supplementation of Food.

निम्नलिखित पर संक्षिप्त टिप्पणियाँ लिखिए :

(अ) खाना पकाने के विभिन्न सिद्धांत

(ब) खाद्य पदार्थों का अनुपूरक ।

9. Write down effect of cooking on nutritive value of various of nutrients. 8

विभिन्न पोषक तत्त्वों के पोषण मूल्य पर खाना पकाने के प्रभाव को लिखिए ।

Roll No. ..... Total Pages : 04

GSE/D-24 1011

FOOD SCIENCE

Course No. 104

Time : Three Hours] [Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting *two* questions from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

प्रत्येक इकाई से दो प्रश्न चुनते हुए, कुल पाँच प्रश्नों के उत्तर दीजिए । प्रश्न संख्या 1 अनिवार्य है । सभी प्रश्नों के अंक समान हैं ।

Compulsory Question (अनिवार्य प्रश्न)

1. Explain in brief of the following : 1×8=8

(i) Kwashiorkor

(ii) Cereals

(iii) Egg yolk

(iv) Processing of pulses

(v) Enrichment of food

(vi) Skim milk

(vii) Poultry (nutritional value)

(viii) Braising.

निम्नलिखित की संक्षिप्त व्याख्या कीजिए :

(i) क्वाशियोरकर

(ii) अनाज

(iii) अंडे की जर्दी

(iv) दालों का प्रसंस्करण

(v) खाद्य संवर्धन

(vi) स्किम दूध

(vii) पोल्ट्री का पोषक मान

(viii) ब्रेजिंग ।

Unit I (इकाई I)

2. Why fruits and vegetable are called protective foods ? How are they good for our health ? 8
फल एवं सब्जियों को सुरक्षात्मक खाद्य पदार्थ क्यों कहा जाता है ? वे हमारे स्वास्थ्य के लिए कैसे अच्छे हैं ?

3. Write short notes on the following :
(i) Pigments present in vegetables 3
(ii) Nutritional and medicinal values of spices. 5
निम्नलिखित पर संक्षिप्त टिप्पणियाँ लिखिए :
(i) सब्जियों में उपस्थित पिंगमेंट
(ii) मसालों के पोषण तथा औषधीय मूल्य ।

Unit II (इकाई II)

4. Explain the nutritional composition of milk in detail. 8
दूध के पोषक संघटन को विस्तार से समझाइए ।

5. List down various nuts and oilseeds. Explain their nutrition value highlighting their importance in our life. 8
विभिन्न मेवों व तिलहनों की सूची बनाइए । हमारे जीवन में उनके महत्व को उजागर करते हुए उनके पोषक मूल्य की व्याख्या कीजिए ।

Unit III (इकाई III)

6. What is the difference between wet and dry cooking method ? Explain various methods of dry cooking along with their advantages and disadvantages. 8
गीली और सूखी विधि द्वारा खाना पकाने की विधियों में क्या अंतर है ? शुष्क भोजन पकाने की विभिन्न विधियों को उनके लाभ एवं हानि सहित समझाइए ।

7. What is germination of food ? How is it done at household level and what are its advantages ? 8
भोजन का अंकुरण क्या होता है ? इसे घरेलू स्तर पर कैसे किया जाता है तथा इसके क्या लाभ हैं ?

7. (a) Examine for extreme values :

$$f(x, y) = x^4 + y^4 - 2x^2 + 4xy - 2y^2.$$ 2½ (4)

(b) Find the volume of the largest rectangular parallelopiped that can be inscribed in the ellipsoid:

$$\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=1.$$ 2½ (4)

SECTION–IV

8. (a) For the curve $x = 3t$, $y = 3t^2$, $z = 2t^3$, show that any plane meets it in three points and find the equation to the osculating plane at $t = t$. 2½ (4)

(b) Find the radius of curvature for the curve :

$$\vec{r} = 3a\cos 2\theta\hat{i} + 4c\sin^3\theta\hat{j} + 4c\cos^3\theta\hat{k} \text{ at } \theta = \frac{\pi}{4}.$$

2½ (4)

9. (a) Find the involute of a circular helix. 2½ (4)

(b) Find the envelope of the plane :

$$\frac{x}{a+u}+\frac{y}{b+u}+\frac{z}{c+u}=1,$$

where u is the parameter. 2½ (4)

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GSM/D–24

MATHEMATICS

(Advanced Calculus)

Paper–BM–231

Time : 3 Hours] [Max. Marks : B.A. : 27, B.Sc. : 40

Note : Attempt **five** questions in all, selecting at least **one** question from each Section. Question No. 1 is compulsory.

Compulsory Question

1. (a) Prove that the function $\sin|x|$ is continuous. 2(2)

(b) State Taylor's Theorem. 1½(1½)

(c) If $z = \tan^{-1}\left(\frac{x}{y}\right)$, then find $\frac{2z}{2x}$ and $\frac{2z}{2y}$. 1½(1½)

(d) Define Principal Normal. 1(1½)

(e) Define Class of Surface. 1(1½)

SECTION–I

2. (a) Prove that the function $f(x) = 2x^2 + 3x - 4$ is uniformly continuous on $[-2, 2]$. 2½ (4)

(b) Show that there is no real number k for which the equation $x^3 - 3x + k = 0$ has two distinct roots in $[0, 1]$. 2½ (4)

3. (a) If a function is twice differentiable on $[a, a + h]$, then show that

$$f(a+h) = f(a) + hf'(a) + \frac{h^2}{2} f''(a+\theta h),\ 0 < \theta < 1.$$

2½ (4)

(b) Evaluate :

$$\lim_{x \to 0} \left(\frac{1}{x^2} - \cot^2 x \right).$$ 2½ (4)

SECTION–II

4. (a) Let $f : R^2 \to R$ be defined by :

$$f(x, y) = x \sin \frac{1}{y} + y \sin \frac{1}{x}, x \neq 0, y \neq 0.$$

Prove that :

$$\lim_{(x,y) \to (0,0)} f(x, y) = 0.$$ 2½ (4)

(b) Show that the function $f : R^2 \to R$ defined by :

$$f(x, y) = \begin{cases} xy \dfrac{(x^2 - y^2)}{x^2 + y^2}; & (x, y) \neq (0, 0) \\ 0 \quad ; & \text{otherwise} \end{cases}$$

is continuous at (0, 0). 2½ (4)

5. (a) If $u = f(r)$, where $r = \sqrt{x^2 + y^2}$; prove that :

$$\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{2y^2} = f''(r) + \frac{1}{r} f'(r).$$ 2½ (4)

(b) If U is a homogeneous function of x, y, z or order n, prove that :

$$x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} + z \frac{\partial u}{\partial z} = nu.$$ 2½ (4)

SECTION–III

6. (a) Show by an example that second order partial derivative of a function may exist at a point but the function is not continuous there at. 2½ (4)

(b) Let

$$f(x, y) = \begin{cases} x^2 \tan^{-1} \dfrac{y}{x} - y^2 \tan^{-1} \dfrac{x}{y}, & \text{if } xy \neq 0 \\ 0 \quad , & \text{if } xy = 0 \end{cases}$$

where $-\frac{\pi}{2} \leq \tan^{-1} \frac{x}{y} \leq \frac{\pi}{2}$. Show that :

$$f_{xy}(0, 0) \neq f_{yx}(0, 0).$$ 2½ (4)

9. (a) Find the null point of the plane $lx + my + nz = 1$ for the system of forces $(x, y, z; l, m, n)$.

(b) A heavy uniform rod rests with one end against a smooth vertical wall and with a point in its length resting on a smooth leg. Find the position of equilibrium and show that it is unstable.

Roll No. ..... Total Pages : 4

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GSM/D-24

MATHEMATICS

(Statics)

Paper–BM-233

Time : Three Hours] [Max. Marks : B.A. : 27, B.Sc. : 40

Note : Attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is Compulsory.

Compulsory Question

1. (a) The resolved part of a force F in a direction is $\sqrt{3}/2$ F. Find its inclination with the force. Also, find the other resolved part.

(b) If the three like parallel forces acting on a rigid body are in equilibrium, then show that each is proportional to the distance between the other two.

(c) P and Q are two like parallel forces. A couple of moment G is combined with them. Show that their resultant is displaced through a distance G/P+Q.

(d) Find the center of gravity of a uniform rod.

SECTION–I

2. (a) If forces P and Q acting at an angle θ be interchanged in position, show that their resultant turns through an angle ϕ such that $\tan \frac{\theta}{2} = \frac{P - Q}{P + Q} \cdot \tan \frac{\theta}{2}$.

(b) Two unlike parallel forces P and Q (P > Q) act at A and B respectively. If P and Q are both increased by x, show that the resultant will move through a distance $\frac{x.\ AB}{P-Q}$.

3. (a) Three like parallel forces P, Q, R act at the corners of the triangle ABC. Prove that their resultant passes through the centroid of the triangle if P = Q = R.

(b) Six coplanar forces act on a rigid body along the sides AB, BC, CD, DE, EF and FA of a regular hexagon of side 1 m. Their magnitude in these directions are 10, 20, 30, 40, P, Q kg wt. respectively. Find P and Q so that the system reduces to a couple and show that the moment of the couple $75\sqrt{3}$ m kg.

SECTION–II

4. (a) A solid cone of height h and semi-vertical angle α is placed with its base against a smooth vertical wall and is supported by a string attached to its vertex and to a point in the wall. Show that the greatest possible length of the string is $h\sqrt{(1+\frac{16}{9}\tan^2\alpha)}$.

(b) Find the center of gravity of a uniform tetrahedron.

5. (a) Two equal heavy rods of weight W and length 2a are freely hinged together and placed symmetrically over a smooth fixed sphere of radius r. Show that the inclination of each rod to the horizontal is given by $r(\tan^3\theta + \tan\theta) = a$.

(b) Two equal weights are attached to the ends of a string which is laid over the top of two equally rough planes having the same altitude and placed back to back, the angles of the inclination of the planes to the horizon being 30° and 60° respectively. Show that the weights will be on the points of motion if the coefficients of friction be $2-\sqrt{3}$.

SECTION–III

6. Four equal rods, each of the length 2a and weight W, are freely joined to form a square ABCD which is kept in shape by a right rod BD and is supported in a vertical plane with BD horizontal, A above C and AB and AD in contact with two fixed smooth legs which are at distance 2b apart on the same level. Find the stress in the rod BD.

7. A force P acts along the axis of x and another force nP along a generator of the cylinder $x^2 + y^2 = a^2$. Show that the central axis lies on the cylinder $n^2(nx-z)^2 + (1+n^2)^2 y^2 = n^4 a^2$.

SECTION–IV

8. Show that the minimum distance between two forces which are equivalent to a given system (R, K) and which are inclined at a given angle 2α is $\frac{2K}{R}\cot\alpha$ and the forces are then each equal to $(\frac{R}{2})\sec\alpha$.

Roll No. ..... Total Pages : 3

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GSM/D-24

PHYSICS

(Wave and Optics-I)

Paper–VI

Time : Three Hours] [Maximum Marks : 40

Note : Question No. 1 is compulsory. Four more questions are to be attempted, selecting one question from each unit. Use of Scientific (Non-programmable) calculator is allowed.

Compulsory Question

1. (a) Discuss fringes with white light? (2)

(b) Explain, what will happen in Newton's ring experiment when air in the interspace is replaced by a transparent liquid. (2)

(c) Differentiate between a zone plate and a convex lens. (2)

(d) Give the difference between the dispersive power and the resolving power of a grating. (2)

UNIT–I

2. (a) Explain the formation of fringes by Lloyd mirror and explain why the central fringe is weak? Find the expression for fringe width. (6)

(b) Two slits in Young's apparatus are 0.2 mm apart. The interference fringes for light of wavelength 6000 Å are formed on the screen 80 cm away. How far is the second bright band from the central fringe? (2)

3. Describe Fresnel's biprism. Explain in detail, how the wavelength of a monochromatic light can be determined. (8)

UNIT–II

4. (a) Describe the construction and working of a Michelson's interferometer. (6)

(b) A thin film of refractive index 1.45 on being introduced in one of the arms of the Michelson's interferometer causes a shift of 5 fringes. If the wavelength of the light used is 5890 Å. Calculate the thickness of the film. (2)

5. Explain the formation of Newton's ring by reflected light. Describe how Newton's rings can be used to determine the wavelength of a monochromatic light? (8)

UNIT–III

6. (a) What is zone plate? Derive an expression for its focal length. (6)

(b) Find the radius for the first half period element on a zone plate behaving like a convex lens of focal length 50 cm (λ = 5000 Å). (2)

7. Describe the phenomena of Fresnel's diffraction pattern produced by circular aperture. Give its analytical treatment. (8)

UNIT–IV

8. Derive an expression for intensity in Fraunhoffer single slit diffraction pattern. Discuss the distribution of intensity in the pattern. (8)

9. Give construction and theory of a plane transmission grating of transmission type. Also explain the formation of spectra by it. (8)

Roll No. ..... Total Pages : 2

864

GSM/D-24

BOTANY

(Biology and Diversity of Seed Plants–I)

Paper–I

Time : Three Hours] [Maximum Marks : 40

Note : *Five* questions to be attempted in all, selecting *two* questions from each unit. Question No. 1 is compulsory. All questions carry equal marks.

Compulsory Question

1. Define the following terms :

(a) Taxonomy.

(b) Species.

(c) Phylogeny.

(d) Infloresence.

(e) Caryopsis.

(f) Pollinium.

(g) Ray floret.

(h) Cyathium. (8×1=8)

UNIT–I

2. Briefly describe the following :

(a) Chemotaxonomy.

(b) Cytotaxonomy. (2×4=8)

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3. Enumerate the Principles of Priority in Relation to taxonomy and discuss about taxonomic keys. (8)

4. Describe the structure of a typical flower and discuss how a flower is different from inflorescence. (8)

5. Write short notes on the following :
   (a) Principles of Botanical Nomenclature.
   (b) Taxonomic Ranks. (4+4=8)

UNIT–II

6. Describe salient features of classification system given by Bentham and Hooker and also discuss its merits and demerits. (8)

7. Write concised notes on the following :
   (a) Bilabiate corolla.
   (b) Gynobasic Style.
   (c) Monoadelphous.
   (d) Carcerulus. (2+2+2+2=8)

8. Discuss the diagnostic features and Economic importance of family Poaceae. (8)

9. (a) Compare the Gynoecium of family Asteraceae and Brassicaceae. (4)
   (b) Floral formula and floral diagram of family Apiaceae and Liliaceae. (4)

Roll No. ..... Total Pages : 3

GSM/D-24 **867**

ZOOLOGY

(Mammalian Physiology-I)

Paper–II

Time : Three Hours] [Maximum Marks : 40

Note : Attempt *five* questions in all, selecting *two* questions from each section. Question No. 1 is compulsory.

Compulsory Question

1. Answer the following in not more than 20 words :

(a) Zwitter ions.

(b) Stereoisomers.

(c) HDLs.

(d) Apoenzyme.

(e) Diffusion.

(f) Retinol.

(g) Marasmus.

(h) Motor Unit.

(i) Osteoblasts.

(j) Achondroplasia. (10×1.5=15)

SECTION–A

2. (a) Explain the chemical bonds involved in protein structure. 4.25

(b) What is protein specificity? 2

3. Explain the following :

(a) Stereoisomerism in Monosaccharides. 3.25

(b) Functions of Polysaccharides. 3

4. Write short notes on :

(a) Acid Number. 2

(b) Reichert/Meissl Number. 2

(c) Saponification. 2.25

5. (a) Describe Osmosis. What is its significance? 3.25

(b) Differentiate between simple diffusion & facilitated diffusion. 3

SECTION–B

6. Write short notes on :

(a) Absorption of amino acids. 4.25

(b) Iodine Deficiency Disorder. 2

7. Describe the disorders caused by the deficiency of the following :

(a) Vitamin B_{12}. 3.25

(b) Iron. 3

8. (a) Describe the ultrastructure of a Skeletal Muscle Fibre. 3.25

(b) Explain the role of calcium in Muscle Contraction. 3

9. Explain the Growth and Reabsorption of Bone. 6.25

Roll No. .....

Total Pages : 3

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871

ELECTRONICS

(Digital Electronics-II)

Paper–II

Time : Three Hours]

[Maximum Marks : 40

Note : There are Nine questions in this paper. All questions carry equal marks. Attempt *five* questions in all. Question No. 1 is compulsory. Attempt remaining *four* questions by selecting *one* question from each unit.

Compulsory Question

1. (a) What do you mean by race around condition? How it can be solved? 2

(b) Write the uses of demultiplexer. 2

(c) What are the differences between Synchronous and Asynchronous counter? 2

(d) How can a ring counter be converted to a Johnson counter? 2

UNIT–I

2. (a) What is code converter ? Design binary to excess-3 code converter. 5

(b) Design a 4 : 1 multiplexer using NAND gates only. 3

3. (a) What is multiplexer? Design a full-adder using two 4 : 1 multiplexers. 4

(b) Discuss a parity generator and checker circuit. 4

UNIT–II

4. (a) Design a J-K flip-flop using D flip-flop. 4

(b) Discuss D-Flip-flop. Draw the characteristics table of D-flip-flop and explain it. 4

5. (a) Describe the working of T flip-flop. 3

(b) Design and explain the working of a positive edge triggered J-K flip-flop. Also draw the characteristics table of J-K flip-flop. 5

UNIT–III

6. (a) Design a modulo-5 counter using T-flip-flops. 4

(b) Design a binary asynchronous counter and also draw its waveforms. 4

7. (a) Design a modulo-10 counter using T-flip-flops. 4

(b) Design a BCD counter and also draw its waveforms. 4

UNIT–IV

8. (a) Discuss the use of shift register in sequence generator. 4

(b) What do you understand by cyclic shift register ? Explain the operation of ring counter using timing diagram. 4

9. (a) Explain the working of a PIPO shift register. Explain how a number can be shifted in and out from such a register. 4

(b) Discuss the working of a SISO shift register. 4

Roll No. ..... Total Pages : 2

NGSM/D-24 **3551**

CELL BIOLOGY & ANIMAL GENETICS

Paper–CC–3 / MCC–4 : B23–ZOO–301

Time allowed : 3 Hours] [Maximum Marks : 50

Note : Attempt **five** questions in all, selecting **one** question from each unit. Question No. **1** is compulsory. All questions carry equal marks. Support your answer with neat and labelled diagrams, wherever necessary.

Compulsory Question

1. Explain the following in about 20-30 words each. 10×1=10

(i)	Autophagy	(ii)	Protein Trafficking
(iii)	Cotransport	(iv)	Nucleosome
(v)	Karyotype	(vi)	Sex influenced trait
(vii)	Trisomy	(viii)	Holandric genes
(ix)	Linkage	(x)	Gene mapping.

UNIT–I

2. (a) Describe any three types of intercellular junctions between the adjacent cell membranes of two cells. 6

   (b) Explain briefly the mechanism of Receptor–mediated Endocytosis. 4

3. (a) Describe the two types of Endoplasmic Reticulum along with their functions. 6

   (b) Explain briefly the structure of Golgi Complex. 4

UNIT–II

4. (a) Differentiate between:
   (i) Euchromatin and Heterochromatin. 3
   (ii) Microtubules and Microfilaments. 3
   (b) Give a brief account of Nuclear Envelope. 4

5. (a) Give a detailed account of Structure of Mitochondria. 6
   (b) Describe the different types of Lysosomes. 4

UNIT–III

6. (a) Describe the mechanism of Crossing over. 6
   (b) Give an account of Genic Balance Mechanism of Sex Determination. 4

7. (a) Explain the inheritance of dextral and sinistral type of coiling in shell of snail. 6
   (b) Explain sex linked inheritance in eye colour of Drosophila. 4

UNIT–IV

8. (a) Give an account of Human Blood Groups and their inheritance. 6
   (b) Write short notes on the following: 4
   (i) Down's syndrome.
   (ii) Klinefelter's syndrome.

9. Explain briefly the following:
   (a) Phenylketonuria 3
   (b) Aminocentesis 3
   (c) Multiple allelism. 4

Roll No. ..... Total Pages : 3

NGSM/D-24 **3556**

CHEMISTRY–III

Paper–CC-3 / MCC–4 : B23-CHE–301

Time allowed : 3 Hours] [Maximum Marks : 40

Note : Attempt **five** questions in all, selecting **one** question from each unit. Question No. **1** is compulsory. All questions carry equal marks.

Compulsory Question

1. Attempt all questions:
   (i) What is inorganic benzene? 1½
   (ii) Define catenation. 1½
   (iii) What is the effect of dilution on molar conductance and specific conductance of an electrolyte solution? 2
   (iv) R and S stand for ..... ? 1½
   (v) Draw energy profile diagram of S_N1 reaction with suitable example. 1½

UNIT–I

2. (a) Explain structure and bonding in diborane $[B_2H_6]$. 3
   (b) What are carbides? Discuss interstitial carbides. 3
   (c) Draw and discuss the structure of XeF_4. 2

3. (a) Compare acidic character of the followings: $HClO$, $HClO_2$, $HClO_3$ and $HClO_4$. 3

(b) Why NaOH is stronger base than $Ba(OH)_2$? 2

(c) Draw and explain cyclic silicates. 3

UNIT–II

4. (a) Define Kohlrausch's Law and explain its three applications. 3

(b) Define Handerson Hazel equation for buffer solutions. 3

(c) The equivalent conductivity of an N/10 solution of a monobasic acid is 45 $Ohm^{-1}cm^2$ and at infinite dilution it is 380 $Ohm^{-1}cm^2$. Calculate the dissociation constant of the acid. 2

5. (a) Write a note on Calomel electrode. 3

(b) Explain potentiometric titration using glass electrode. 2

(c) Can a solution of 1 M copper sulphate be stored in a vessel made of Nickel metal? Given that: 3

$E°_{Ni,Ni^{2+}} = 0.25$ Volt and $E°_{Cu,Cu^{2+}} = 0.34$ Volt.

UNIT–III

6. (a) What are terminal and non–terminal alkynes? Give one example of each. 3

(b) Explain Kolbe's electrolytic reaction to synthesis acetylene. 2

(c) Write hydroboration followed by oxidation of 2–butyne reaction as electrophilic addition reaction of alkynes. 3

7. (a) What do you mean by metamerism? Give two examples. 2

(b) Distinguish between enantiomers and diastereomers with suitable examples. 3

(c) Write the keto–enol forms of acetoacetic ester and pentane–2,4–dione. 3

UNIT–IV

8. (a) Explain Huckel's rule of aromaticity. 2

(b) Write the mechanism of nitration of benzene using nitrating mixture. 3

(c) What do you understand by the term 'Orientation'? Explain with example, how in aromatic compounds further substitution is governed by the nature of substituent already present in the ring? 3

9. (a) Write and explain Williamson's synthesis reaction. 2

(b) Arrange the following halides in reactivity order towards nucleophilic substitution reaction: CH_3F, CH_3Cl, CH_3Br and CH_3I. 2

(c) Why aryl halides are less reactive than alkyl halides towards nucleophilic substitution reaction? 2

(d) Give the elimination addition mechanism of conversion of chlorobenzene into aniline. 2

Roll No. .....

Total Pages : 3

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3558

COMBINATIONAL & SEQUENTIAL CIRCUITS

Paper–CC–3 / MCC–4 : B23–ELE–301

Time allowed : 3 Hours]

[Maximum Marks : 50

Note : Attempt **five** questions in all, selecting **one** question from each unit. Question No. **1** is compulsory. All questions carry equal marks.

Compulsory Question

1. Attempt all questions: 5×2=10

   (i) Differentiate between combinational and sequential circuits.

   (ii) Discuss the performance comparison of Multiplexer and Demultiplexer.

   (iii) Enlist the applications of counter.

   (iv) Draw the circuit of full adder using two half adders.

   (v) Differentiate between flip flop and Latch. Why D flip–flop is called data latch?

UNIT–I

2. (a) Design a combinational circuit having four inputs and two outputs. One of the outputs is high when

majority of the inputs are high. The second output is high only when all the inputs are of same type. 5

(b) What do you mean by parity? Design a three bit even parity generator and verify the circuit using example. 5

3. (a) Design a full Subtractor circuit. Realize the expression using NAND gates only. 5

(b) Design a common light switching system for a group of flats. 5

UNIT–II

4. (a) Implement Full adder circuit using 1:8 Demultiplexer.

(b) Design a 4 bit Gray to Binary Code converter. 5

5. (a) What do you mean by Encoder circuits? Design a 4 bit priority encoder. 5

(b) Implement the following function using single Multiplexer:

$F=\Sigma m(0, 2, 4, 7, 8, 11, 12, 13, 15)$. 5

UNIT–III

6. (a) Design the conversion logic to convert J-K flip flop to T flip flop. 5

(b) What do you mean by excitation table? How is it different from Truth table? Make the excitation tables for all the Flip flops. 5

7. (a) What is function of preset and clear in flip flops? Explain the working of J-K flip flop. 5

(b) What do you mean by Race around condition? How is it eliminated? Differentiate between Latch and Flip flop. 5

UNIT–IV

8. (a) Design a 4 bit synchronous counter using J-K Flip flop. Use Kmap to design the circuits. 5

(b) Design 3 bit up/down ripple counter. 5

9. (a) Design Modulus –10 synchronous counter using T flip-flop. 5

(b) Explain the working of BCD counter with its circuit diagram. 5

Roll No. ..... Total Pages : 3

NGSM/D-24 **3559**

THERMODYNAMICS & STATISTICAL PHYSICS

Paper–CC–3/MCC–4 : B23–PHY–301

Time allowed : 3 Hours] [Maximum Marks : 50

Note : Attempt **five** questions in all, selecting **one** question from each unit. Question No. **1** is compulsory. All questions carry equal marks. The symbols have their usual meaning.

Compulsory Question

1. Attempt all questions: 5×2=10

   (i) State first law of Thermodynamics. What are limitations of first law of Thermodynamics?

   (ii) How does the Clausius–Clapeyron equation explain the change in boiling point with pressure?

   (iii) Difference between Statistical Probability and Priori Probability.

   (iv) Write the factors which determine the Thermodynamics Probability of a macrostate.

   (v) Distinguish between classical and quantum statistics.

UNIT–I

2. (a) State and prove Carnot's theorem. 7

   (b) What is the difference between Joule–Thomson effect and Adiabatic cooling? 3

3. (a) Define Entropy. Show that change in Entropy over a reversible cycle is always zero. 5

   (b) What is Adiabatic demagnetisation? 3

   (c) Calculate the change in Entropy when 10 gram of ice at 0°C is converted into water at the same temperature. 2

UNIT–II

4. (a) Derive Clausisus–Clapeyron's equation: 8

$$\frac{dP}{dT} = \frac{L}{T(V_2 - V_1)}$$

   (b) Calculate the specific heat of saturated steam from second latent heat equation. Given: 2

$L = 22.7\times10^5 jKg^{-1}$, $T = 373K$, $\frac{dL}{dT} = 2688 jKg^{-1} k^{-1}$, $C_1 = 4242\ jKG^{-1}\ k^{-1}$. Explain the meaning of negative value obtained.

5. (a) Draw and explain P–T Phase diagram of water. What is Triple point. 5

   (b) Explain the four Thermodynamical function. 5

UNIT–III

6. (a) Prove that Entropy of a system is proportional to the logarithm of probability of that system. Identify K. 6

   (b) Discuss the common approach in dealing with M–B, B–E and F–D statistics. 4

7. (a) Using Maxwellian speed distribution, derive expression for: Most probable speed, Average speed and Root mean square speed of molecule. 8

   (b) Find the temperature at which the average speed of molecule of nitrogen gas is $1/\sqrt{7}$ times the average speed of oxygen gas molecules at 300K. 2

UNIT–IV

8. (a) Explain Dulong and Petit Law. Give discrepancy of Dulong and Petit's model for specific heat of solids. 8

   (b) Show that Maxwell–Bolltzmann distribution is the limiting case of Bose Einstein distribution. 2

9. (a) Using B–E distribution law, derive Planck's law for black body relation. 6

   (b) Comparison of Maxwell–Bolltzmann, Bose Einstein and Fermi Dirac statistics. 4

(b) Find the complete integral of following by Charpit's method : 5

$$pxy + pq + qy = yz.$$

9. (a) Solve the equation : 5

$$\frac{\partial^2 z}{\partial x^2} - 4\frac{\partial^2 z}{\partial x \partial y} + 3\frac{\partial^2 z}{\partial y^2} = \sqrt{x + 3y}.$$

(b) Solve by Jacobi's method : 5

$$(x_2 + x_3)(p_2 + p_3)^2 + zp_1 = 0.$$

Roll No. ..... Total Pages : 4

NGSM/D-24 **3565**

DIFFERENTIAL EQUATIONS–I

Paper–CC–3/MCC–4 : B23–MAT–301

Time Allowed : 3 Hours] [Maximum Marks : 50

Note : Attempt **five** questions in all, selecting **one** question from each Unit. Question No. **1** is compulsory. All questions carry equal marks.

Compulsory Question

1. (a) Verify that $y = A\cos x + B\sin x$ is a solution of the differential equation $\frac{d^2y}{dx^2} + y = 0.$ 2

(b) Find the Orthogonal trajectories of the causes : 2

$$y = ax^n.$$

(c) Solve by method of variation of parameters : 2

$$\frac{d^2y}{dx^2} + y = x.$$

(d) Solve $p + 3q = z + \cot(y - 3x).$ 2

(e) Show that the equation : 2

$f(x, y, p, q) = 0, g(x, y, p, q) = 0$ are compatible if

$$\frac{\partial(f, g)}{\partial(x, p)} + \frac{\partial(f, g)}{\partial(y, p)} = 0.$$

UNIT–I

2. (a) Solve the differential equation : 5

$$(3x - 7y - 3)dy + (7x - 3y - 7)dx = 0.$$

(b) Show that $\frac{1}{x^2y^2}$ is the integrating factor of the equation $(1 + xy)y\,dx + (1 - xy)x\,dy = 0$. 5

3. (a) Solve the following : 5

$$y = px + p - p^2.$$

(b) Obtain the complete primitive and the singular solution of $x\left(\frac{dy}{dx}\right)^2 - 2y\frac{dy}{dx} + 4x = 0$. 5

UNIT–II

4. (a) Find the Orthogonal trajectories of the series of Hypocycloids $x^{2/3} + y^{2/3} = a^{2/3}$. 5

(b) Solve the differential equation : 5

$$\frac{d^2y}{dx^2} - y = \cosh x.$$

5. (a) Solve the differential equation : 5

$$x^2\frac{d^2y}{dx^2} - 2y = x^2 + \frac{1}{x}.$$

(b) Solve $(D^2 - 4D + 4)y = e^{2x}\cos^2 x$. 5

UNIT–III

6. (a) Solve $x\frac{d^2y}{dx^2} - (2x - 1)\frac{dy}{dx} + (x - 1)y = 0$. 5

(c) Solve the following Simultaneous equations : 5

$$\frac{dx}{dt} = 2y, \frac{dy}{dt} = 2z, \frac{dz}{dt} = 2x.$$

7. (a) Solve the total differential equation : 5

$$yz(y + z)\,dx + zx(x + z)\,dy + xy(x + y)\,dz = 0.$$

(b) Solve $(x^2 - yz)p + (y^2 - zx)q = z^2 - xy$. 5

UNIT–IV

8. (a) Find the integral surface of $x^2p + y^2q + z^2 = 0$. Which passes through the hyperbola $xy = x + y, z = 1$. 5

Roll No. ..... Total Pages : 2

NGSM/D-24 **3573**

OPERATING SYSTEM

Paper–CC–3 / MCC–4 : B23–CSE–301

Time allowed : 3 Hours] [Maximum Marks : 50

Note : Attempt **five** questions in all, selecting **one** question from each unit. Question No. **1** is compulsory. All questions carry equal marks.

Compulsory Question

1. Attempt all questions:
   (i) What is Real Time and Time Sharing operating system?
   (ii) Define Semaphores.
   (iii) Write characteristics of Multi user operating system.
   (iv) Define process and its states.

UNIT–I

2. (a) Define Operating system, its structure.
   (b) Discuss Multi–programming versus Multi–processing.
3. (a) What is concept of process management?
   (b) Discuss Inter–Process Communication.

UNIT–II

4. What is CPU scheduling, explain Multiple Processor Scheduling.

5. (a) Discuss critical section problem, give reference to Dining Table Problem.

(b) Explain Deadlock Prevention, Avoidance and Deadlock Recovery.

UNIT–III

6. Explain Partitioning, Swapping and Contiguous Memory Allocation.

7. Write note on the following:

(a) Demand Paging.

(b) Discuss Page Replacement Algorithms.

UNIT–IV

8. What is Disk Scheduling? Explain Disk Scheduling Algorithms.

9. Write note on the following:

(a) Discuss types of File and operations on a File.

(b) Explain structure and operations on Sequential File.

Roll No. .....

Total Pages : 3

NGSM/D-24

3602

FOOD SCIENCE

Paper–CC–B3 : B23–HSC–302

Time allowed : 3 Hours] [Maximum Marks : 50

Note : Attempt **five** questions in all, selecting **one** question from each unit. Questions No. **1** is compulsory. All questions carry equal marks.

प्रत्येक इकाई से **एक** प्रश्न का चयन करते हुए, कुल **पाँच** प्रश्नों के उत्तर दीजिए। प्रश्न संख्या **1** अनिवार्य है। सभी प्रश्नों के अंक समान हैं।

Compulsory Question (अनिवार्य प्रश्न)

1. Define the following terms: 4×2½=10

निम्नलिखित को परिभाषित कीजिए:

(i) Food
भोजन

(ii) Oilseeds
तिलहन

(iii) Solar cooking
सौर ऊर्जा से खाना पकाना

(iv) Enrichment.
समृद्ध।

UNIT–I (इकाई–I)

2. Discuss the food groups and food guide pyramid along with its importance. 10

खाद्य समूहों एवं खाद्य मार्गदर्शक पिरामिड की महत्ता सहित चर्चा कीजिए।

3. Describe the composition and nutritional contribution of pulses group. 10

दालों के समूह की संरचना एवं पोषण संबंधी योगदान का वर्णन कीजिए।

UNIT–II (इकाई–II)

4. Discuss the composition of milk and milk products. 10

दूध और दूध उत्पादों की संरचना पर चर्चा कीजिए।

5. Write an elaborate note on nutritional composition of Indian spices. 10

भारतीय मसालों की पोषण संरचना पर एक विस्तृत टिप्पणी लिखिए।

UNIT–III (इकाई–III)

6. What are the objectives of cooking? Differentiate between moist heat and dry heat methods. 10

खाना पकाने के उद्देश्य क्या हैं? नम ताप और शुष्क ताप विधियों के बीच अंतर कीजिए।

7. Discuss the effect of cooking and heat on nutritive value of foods. 10

खाद्य पदार्थों के पोषक मूल्य पर खाना पकाने और गर्मी के प्रभाव पर चर्चा कीजिए।

UNIT–IV (इकाई–IV)

8. Write down the method, advantage and disadvantage of fermentation. 10

किण्वन की विधि, लाभ एवं हानि लिखिए।

9. What is supplementation? Write an elaborate note on supplementary foods. 10

अनुपूरण क्या है? पूरक आहार पर एक विस्तृत टिप्पणी लिखिए।

Roll No. ..... Total Pages : 3

NGSM/D-24 **3604**

HYGIENE & HUMAN PHYSIOLOGY

Paper–CC–M3 : B23–HSC–304

Time allowed : 3 Hours] [Maximum Marks : 50

Note : Attempt **five** questions in all, selecting **one** question from each unit. Question No. **1** is compulsory. All questions carry equal marks.

प्रत्येक इकाई से **एक** प्रश्न का चयन करते हुए, कुल **पाँच** प्रश्नों के उत्तर दीजिए। प्रश्न संख्या 1 अनिवार्य है। सभी प्रश्नों के अंक समान हैं।

Compulsory Question (अनिवार्य प्रश्न)

1. Discuss the following in brief: 4×2½=10

निम्नलिखित पर संक्षेप में चर्चा कीजिए:

(i) Food hygiene.
खाद्य स्वच्छता।

(ii) Control of diseases spread by ingestion.
खाने से फैलने वाली बीमारियों पर नियंत्रण।

(iii) Cell division.
कोशिका विभाजन।

(iv) Functions of blood.
रक्त के कार्य।

UNIT–I (इकाई–I)

2. What do you mean by vaccination? Discuss. Elaborate vaccination schedule in detail. 10

टीकाकरण से आप क्या समझते हैं? चर्चा कीजिए। टीकाकरण कार्यक्रम का विस्तार से वर्णन कीजिए।

3. Describe health. Explain different factors affecting health in detail. 10

स्वास्थ्य का वर्णन कीजिए। स्वास्थ्य को प्रभावित करने वाले विभिन्न कारकों की विस्तार से व्याख्या कीजिए।

UNIT–II (इकाई–II)

4. Describe the following:

निम्नलिखित का वर्णन कीजिए:

(b) Causes of diarrhea and dysentery. 4

दस्त और पेचिश के कारण।

(b) Symptoms of Dengue. 3

डेंगू के लक्षण।

(c) Prevention of T.B. 3

टी.बी. की रोकथाम।

5. Write the causes, symptoms and prevention or control of AIDS in detail. 10

एड्स के कारण, लक्षण और रोकथाम या नियंत्रण के बारे में विस्तार से लिखिए।

UNIT–III (इकाई–III)

6. Elaborate animal cell with a well labelled diagram in detail. 10

एक अच्छी तरह से लेबल किए गए चित्र के साथ पशु कोशिका का विस्तार से वर्णन कीजिए।

7. Describe digestive glands. Explain various digestive glands in detail. 10

पाचन ग्रंथियों का वर्णन कीजिए। विभिन्न पाचन ग्रंथियों के बारे में विस्तार से बताएं।

UNIT–IV (इकाई–IV)

8. Explain the structure and functions of Heart with a well labelled diagram. 10

हृदय की संरचना और कार्यों को एक अच्छी तरह से लेबल किए गए चित्र के साथ समझाएँ।

9. Elaborate the structure and functions of adrenal gland and pituitary gland. 5, 5

अधिवृक्क ग्रंथि और पिट्यूटरी ग्रंथि की संरचना और कार्यों को विस्तार से बताएँ।

Roll No. .....

Total Pages : 3

26341

NBSIT/D-24

INFORMATION TECHNOLOGY

(Industrial Electronics)

Paper : B23-HIT-301

Paper Type : CC-4/MCC-A4

Time : Three Hours]

[Maximum Marks : 50

Note : Attempt five questions in all, selecting one question from each unit. Question no 1 is compulsory. All questions carry equal marks.

Compulsory Question

1. (a) How can we identify the anode and cathode in a diode using multimeter? 2.5

(b) What is the use of voltage regulators? 2.5

(c) What is the difference between thyristor and transistor? 2.5

(d) What is the difference between RS-232 and RS-485 communication protocols? 2.5

UNIT–I

2. Explain the construction and working of an Analog multimeter with the help of suitable block diagram. 10

3. (a) How can we increase the range of voltage and current measurements in a multimeter. 6

(b) What are the different safety considerations in industrial electronics? 4

UNIT–II

4. (a) With the help of block diagram explain the different parts of a Cathode Ray Oscilloscope. 8

(b) What is difference between 78XX and 79XX series of regulators? 2

5. (a) Explain the working of Transistor series voltage regulator with proper circuit diagram. 7

(b) What is need of vertical and horizontal deflection systems in CRO? 3

UNIT–III

6. (a) Explain the principle and working of Switch Mode Power Supply (SMPS). 6

(b) Draw and explain the VI characteristics of SCR. 4

7. Explain the construction and working of an SCR. Using two transistor analogy explain why gate trigger is not required to sustain an SCR in conduction after turning on? 10

UNIT–IV

8. (a) What is the difference between a converter and inverter? 3

(b) Explain the different types of DC-DC converters: buck, boost and buck-boost. 7

9. (a) Explain the different field bus systems like Profibus and Modbus. What do you mean by redundancy in a field bus system? 6

(b) Write short note on Variable frequency Drives. 4

Roll No. ..... Total Pages : 2

26342

NBSIT/D-24

INFORMATION TECHNOLOGY

(Computer Programming With C)

Paper : B23-HIT-302

(CC-5/MCC-A5)

Time : Three Hours] [Maximum Marks : 50

Note : Attempt *five* questions in all by selecting *one* question from each unit. Question number 1 is compulsory. All questions carry equal marks.

Compulsory Question

1. Write short notes on the following :

(a) Flow Chart.

(b) Goto statement.

(c) Register storage class.

(d) Row major order of storage.

UNIT–I

2. What do you mean by a Program in C? Explain the structure of a program with syntax using suitable examples.

3. What is an operator in C language? Explain the arithmetic, relational and logical operators with suitable examples.

UNIT–II

4. Explain the following with suitable examples :
if, nested-if and else-if ladder

5. What do you mean by repetition of statements in a program? Write a Program to find the reverse of an integer.

UNIT–III

6. (a) What are the objectives of structured programming?
(b) Explain user defined functions in C language.

7. Write a program to find the largest element in the array by passing the array and its size to the function largestFromArray(int arr[], int size).

UNIT–IV

8. What do you mean by 2-dimensional arrays in C? Explain the storage structure of them.

9. (a) What do you mean by a pointer? How are they different from variables and why are they used in programs?
(b) Explain the use of struct keyword in C language with suitable examples.

Roll No. .....

Total Pages : 03

GSM/D-24

1015

INTRODUCTION TO CLOTHING CONSTRUCTIONS

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting *two* questions from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

प्रत्येक इकाई से **दो** प्रश्न चुनते हुए, कुल **पाँच** प्रश्नों के उत्तर दीजिए । प्रश्न संख्या **1** अनिवार्य है । सभी प्रश्नों के अंक समान हैं ।

1. Write short notes on the following : 2×4=8

(a) Yarn

(b) Fibre

(c) Filament

(d) Weave.

निम्नलिखित पर संक्षिप्त टिप्पणियाँ लिखिए :

(अ) धागा

(ब) फाइबर

(स) रेशा

(द) बुनाई ।

Unit I (इकाई I)

2. Discuss parts of sewing machine and their functioning. 8

   सिलाई मशीन के भागों और उनकी कार्यप्रणाली पर चर्चा कीजिए ।

3. Discuss the equipments and supplies used in clothing construction and their maintenance. 8

   वस्त्र निर्माण में उपयोग किए जाने वाले उपकरणों और आपूर्तियों तथा उनके रखरखाव पर चर्चा कीजिए ।

4. Explain defects in sewing machine and how to overcome them ? 8

   सिलाई मशीन में दोषों की व्याख्या कीजिए और उन्हें दूर करने के तरीके बताइए ।

5. Explain care of sewing machine. 8

   सिलाई मशीन की देखभाल के बारे में बताइए ।

Unit II (इकाई II)

6. What do you mean by clothing ? Explain its importance. 8

   वस्त्र से आपका क्या अभिप्राय है ? इसका महत्व बताइए ।

7. Explain general principles of clothing construction. 8

   वस्त्र निर्माण के सामान्य सिद्धांतों की व्याख्या कीजिए ।

8. Differentiate the following : 4×2=8

   (a) Drafting

   (b) Paper pattern.

   निम्नलिखित में अंतर बताइए :

   (अ) ड्राफ्टिंग

   (ब) पेपर पैटर्न ।

9. Discuss the steps of preparation of fabric for garment making. 8

   परिधान बनाने के लिए कपड़े की तैयारी के चरणों पर चर्चा कीजिए ।

Roll No. .....

Total Pages : 03

GSQ/D-24

957

QUANTUM AND LASER PHYSICS

Paper : IX

PH-502

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory.

(Compulsory Question)

1. (a) Differentiate between Group velocity and Phase velocity. 2

   (b) Calculate the least and maximum values of wavelength obtained when γ rays of energy 0.5 MeV are scattered by the matter. 2

   (c) Explain the concept of Quantum Mechanical Tunneling. 2

   (d) What is Line Broadening ? Elaborate. 2

Unit I

2. (a) What will be the de-Broglie wavelength of an electron having kinetic energy of 700 eV. 2

   (b) Derive the expression for Kinetic energy of recoil electron in term of scattering angle of photons. 6

3. (a) Explain the meaning of ψ and $|\psi|^2$. 2

(b) What is the importance of normalization of wavefunctions ? Show that two eigen functions corresponding to the different energy eigenvalues are orthogonal to each other. 6

Unit II

4. (a) Define step potential. Solve Schrödinger wave equation for a particle in step potential for $E > V_0$. 6

(b) Find the values of momentum and energy for an electron in a box of length 1 Å for $n = 1, 2$. 2

5. Solve Schrödinger wave equation to evaluate the energy levels for the ground state and excited states of Linear Harmonic Oscillator and show that its energy levels are discrete. 8

Unit III

6. (a) Write a note on types of coherence. For a source of light having coherence time $t_c \sim 10^{-9}$ s. Calculate the degree of non-monochromaticity for $\lambda_0 = 5800$ Å. 4

(b) Define Einstein's coefficient. Find the expression for ratio of spontaneous to stimulated emission in thermodynamic equilibrium. 4

7. (a) Derive the expression for Schawlow-Townes threshold condition for the laser oscillation. 6

(b) Explain the quantum amplification and quantum switch in active medium. 2

Unit IV

8. Discuss the principle, construction and working of Ruby laser with suitable diagrams. Out of He-Ne laser and Ruby laser, which has more monochromaticity ? 8

9. (a) What are the main features of semiconductor laser ? How does laser action take place in it ? 6

(b) Give some important applications of lasers in medicine and industry. 2

Roll No. ..... Total Pages : 03

GSQ/D-24 958

NUCLEAR PHYSICS
PH-502

Time : Three Hours] [Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks. Non-programmable calculator is allowed.

(Compulsory Question)

1. (i) Describe the property which gives information about the shape of the nucleus. **2**

(ii) How will you distinguish between neutrino and anti-neutrino ? **2**

(iii) What is difference between the synchrocyclotron and a cyclotron ? **2**

(iv) What is nuclear cross-section ? What is its unit ? **2**

Unit I

2. (a) What is Moseley's law ? Describe how charge of nucleus is different determined by it ? **5**

(b) What is nuclear mass ? Defined one atomic mass unit (a.m.u) and give its energy equivalent. 3

3. (a) What is mass defect of nucleus ? Derive expression for binding energy per nucleon of nucleus. Also describe the binding energy curve. 6

(b) Calculate the mass number of the nucleus whose radius is 5.2×10^{-15} m. 2

Unit II

4. Describe the various types of beta-decay and their energetics. Outline the evidence that lead to discovery of neutron. 8

5. State the law of absorption of gamma rays. Define Linear absorption Coefficient and mass absorption Coefficient in relation to the interaction of radiation with matter. What are half thickness and radiation lengths ? 8

Unit III

6. Explain the principle, construction and working of Tandem accelerator. 8

7. Describe the working of a G.M. counter with special reference to : 8

(a) construction

(b) quenching

(c) characteristics (plateau).

Unit IV

8. Explain the possibility of nuclear fusion reactor. Also, explain plasma containment and pinch effect. 8

9. (a) What is a chain reaction ? How is growing chain reaction controlled to go to a study pace ? 6

(b) Give some conservation laws of nuclear reaction. 2

7. (a) Write the modern mechanism for the formation of osazone of glucose. 3

(b) Explain the difference between anomers and epimers, taking suitable examples. 3

8. (a) How will you synthesize the following compounds using appropriate organometallic compounds ? 3

(i) Ethyl methyl ketone

(ii) *iso*-butylic acid

(b) How can ring size of glucose is determined ? Discuss. 3

9. (a) Write notes on the following : 3

(i) Ruff degradation

(ii) Kiliani-Fischer synthesis.

(b) Oxidation of D-Fructose with Tollen's reagent yields a mixture of anions of DMannonic and D-gluconic acids. Explain. 3

Roll No. ..... Total Pages : 04

GSQ/D-24 961

ORGANIC CHEMISTRY(TH)

Time : Three Hours] [Maximum Marks : 32

Note : Attempt *Five* questions in all. Question No. **1** is compulsory. Attempt four more questions, selecting *two* questions from each Section.

1. (a) By using suitable Grignard reagent, how would you synthesize the following compounds :

(i) Isopropyl alcohol

(ii) Benzoic acid

(b) What kind of NMR spectra do you expect from :

(i) Toluene

(ii) *p*-Dichlorobenzene

(c) What is Amylase ? Draw its structure.

(d) Explain any *two* factors influencing chemical shift in NMR spectroscopy. 2,2,2,2

Section A

2. (a) How would you distinguish acetone and methyl acetate on the basis of NMR spectroscopy ? Explain. 3

   (b) Discuss the NMR spectra of ordinary ethanol and ultrapure ethanol. Explain the difference between them. 3

3. (a) An ordinary hydrocarbon (molecular mass 134) exhibits the following PMR data : 3

   (i) a doublet at δ 0.88 (6H)

   (ii) a multiplet at δ 1.86 (1H)

   (iii) a doublet at δ 2.45 (2H)

   (iv) a singlet at δ 7.12 (5H).

   Asssign a suitable structure to the hydrocarbon.

   (b) How will you distinguish between the following pair of compounds on the basis of PMR spectroscopy ? 3

   (i) CH_3CH_2CHO and CH_3COCH_3

   (ii) $(CH_3)_3CCOOCH_3$ and $(CH_3)_3COCOCH_3$

4. (a) What do you mean by enantiotopicprotons ? Explain giving example. Are these protons magnetically equivalent. 3

   (b) Explain the principle and applications of NMR spectroscopy. 3

5. (a) A compound having molecular formula $C_9H_{11}Br$ shows the following set of NMR data : 3

   (i) Multiplet δ 2.25, 2H

   (ii) Triplet δ 2.72, 2H

   (iii) Triplet δ 3.38, 2H

   (iv) Singlet δ 7.22, 5H.

   Write the structure of the compound and discuss its NMR.

   (b) PMR spectrum of an organic compound recorded on 80 MHz instrument shows a single signal at 98Hz. Compare the position of the signal using 120MHz spectrometer. What would be the position of the signal in δ units in each instrument ? 3

Section B

6. (a) Describe any *two* methods for the preparation of organolithium compounds. 3

   (b) Draw the Haworth formula structure for the following : 3

   (i) α–D (+) glucose

   (ii) Sucrose.

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Total Pages : 03

967

GSQ/D-24

EVOLUTION AND DEVELOPMENTAL BIOLOGY

Paper : II

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting *two* questions each from Section A and Section B. Q. No. **1** is compulsory.

1. Define the following : **8×1=8**

(i) Frame shift mutations

(ii) Darwin's Finches

(iii) Atavism

(iv) Coacervates

(v) Coeloblastula

(vi) Function of Acrosome

(vii) Meiolecithal Egg

(viii) Significance of Grey Crescent.

Section A

2. (a) Explain Analogous organs in support of evolution giving at least three examples. 4

(b) Write all you know about Lederberg's replica plating experiment. 4

3. (a) Define "Ontogeny repeats Phylogeny". Explain the Haeckel's Biogenetic Law as an evidence of organic evolution. 4

(b) Explain in detail Palaentological evidences in support of Organic evolution. 4

4. (a) Explain the four basic steps of Organic Evolution as enlisted in Modern concept of Evolution. 4

(b) Differentiate between Allopatric and Sympatric Speciation. 4

5. Explain the chronology of various human types. 8

Section B

6. Write short notes on the following :

(a) Vitellogenesis 4

(b) Patterns of Cleavage. 4

7. Write you all know about

(a) Parthenogenesis. 4

(b) Discoblastula 2

(c) Significance of cleavage. 2

8. Describe the process of Gastrulation in Chick. 8

9. (a) Write various functions of Amnion and Chorion. 4

(b) Describe mechanism of regeneration of a Limb of a Newt/Salamander. 4

(iii) Colour mixing

(iv) Hue.

(b) Explain the working of Videocon Camera Tube. What are its applications ? 4

Roll No. ..... Total Pages : 04

GSQ/D-24 971

ELECTRONICS COMMUNICATION

Time : Three Hours] [Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

1. (a) Why the frequency of career is kept high in communication system ?

(b) Why the Y signal set = 0.3R + 0.59G + 0.11B

(c) Compare High level and Low level modulation.

(d) What are the requirements that composite colour signal fulfill to be compatible with monochrome signal ? **2×4=8**

Unit I

2. (a) Calculate the percentage power saving for the SSB signal if the AM wave is modulated to a depth of (a) 100% and (b) 50%. 4

(b) What do you mean by Amplitude Modulation ? Derive the expression for the AM modulated Carrier wave. 4

3. (a) Explain the working of Grid modulated AM Modulator. 5

(b) A sinusoidal carrier voltage of frequency 1MHz and amplitude 100 V is modulated by a sinusoidal voltage of frequency 5 kHz producing 50% modulation. Calculate the frequency and amplitude of USB and LSB. 3

Unit II

4. (a) Prove that in frequency modulation produced sidebands theoretically extends to infinity. 4

(b) In an FM system the frequency deviation is 4 kHz, when audio modulating frequency is 200 Hz and audio modulation voltage is 4V. Compute the modulation index and also compute the Frequency deviation and modulation index when the AF voltage is increased to 8 volt and audio modulating frequencies is increased to 800 Hertz. 4

5. (a) Explain the working of Foster Seely phase Discriminator along with its advantage and disadvantage. 6

(b) What do you understand by significant sidebands in frequency modulation ? 2

Unit III

6. (a) Define kell factor. How does it affect vertical resolution of a television picture ? Show that vertical resolution increases with increase in number of scanning lines. 4

(b) Write a short note on Video Composite Signal. 4

7. (a) Explain, why the number of lines in TV system are kept odd ? 4

(b) Define the terms : 4

(i) Aspect Ratio

(ii) Kell Factor

(iii) Resolution

(iv) Odd field and Even Field.

Unit IV

8. Explain the block diagram of monochrome TV receiver in detail. 8

9. (a) Explain in brief : 4

(i) Luminance

(ii) Compatibility

Roll No. .....

Total Pages : 3

26323

BSIT/D-24

WEB-SITE DESIGN IMPLEMENTING
BASIC DESIGN TOOLS–I
Paper : BSIT-503

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *five* questions in all, selecting *one* question from each unit. Question No. 1 is compulsory. Each question carries equal marks.

Compulsory Question

1. Write short notes on :

(a) Briefly explain what HTML stands for and its primary purpose in web development.

(b) Define the purpose of the <ins> and <del> elements in HTML.

(c) Explain the significance of the HREF attribute in external links.

(d) Explain the significance of the rowspan attribute in HTML tables. (2×4=8)

UNIT–I

2. (a) Give an example of a body element in HTML and explain its purpose. 4

(b) Explain with examples the tags used for beautification of HTML document and explain their impact on document appearance. 4

3. Define nesting in HTML and its importance in creating well-structured documents. Also Provide rules and examples illustrating the proper use of nesting in HTML. 8

UNIT–II

4. Differentiate between block-level and text level elements in HTML, giving one example of each. 8

5. Write Short notes on following head section elements :
   (a) <title>
   (b) <meta>
   (c) <link>
   (d) <style> (2×4=8)

UNIT–III

6. (a) Briefly explain the process of creating an internal link that jumps to a named anchor in an HTML document. 4
   (b) Describe the concept of default pages when creating internal links. How does it impact navigation within a website? 4

7. Develop a webpage for online Courses offered by XYZ College showcasing three courses. Each Course should be represented by an image, and clicking on the image should lead to a detailed description page about the clicked course. 8

UNIT–IV

8. Develop an HTML webpage that utilizes tables to present a simple product catalog. Include relevant information such as product names, descriptions, prices, and availability. Apply attributes like colspan and border for effective presentation. 8

9. (a) Define the purpose of the <table> element in HTML. Provide a brief explanation of its role in document structure. 4
   (b) How can the <caption> element be utilized in HTML tables? Briefly discuss its role in enhancing table accessibility. 4

Roll No. ..... Total Pages : 3

BSIT/D-24 **26325**

MICROPROCESSOR ARCHITECTURE AND PROGRAMMING-III

Paper–BSIT-505

Time : Three Hours] [Maximum Marks : 40

Note : There are *nine* questions in this paper. All questions carry equal marks. Attempt *five* questions in all. Question No. 1 is compulsory. Attempt remaining *four* questions by selecting *one* question from each unit.

Compulsory Question

1. (a) What are the advantages of software interrupts? 2

(b) How is the physical memory organized in the 8086? 2

(c) What are the advantages of a multiprocessor system? 2

(d) How many address lines and data lines are present in the 80586 and the Pentium? 2

UNIT–I

2. (a) Discuss the stack structure of 8086 processor. 4

(b) Explain the interrupt structure of the 8086 in detail. 4

3. (a) What do you understand by hardware interrupt and software interrupt? Explain in brief with examples. 4

(b) What do you mean by Macro? Discuss the process of passing parameters to macro. 4

UNIT–II

4. (a) What are the differences between memory-mapped I/O and I/O-mapped I/O? 4

(b) How are the Memory Read and Memory Write control signals generated in the minimum mode of operation of the 8086? 4

5. (a) Explain the procedure of interfacing dynamic RAM with 8086. 4

(b) What is meant by fixed port addressing in the 8086 and how many input/output devices can be connected to the 8086 by this method? 4

UNIT–III

6. Explain the architecture of numeric processor 8087. 8

7. Describe how the interfacing of the A/D converter is done with the microprocessor 8086. Give its suitable diagram. 8

UNIT–IV

8. (a) Compare 80386 and Pentium 4. 4

(b) Discuss in brief the design issues of RISC processors. 4

9. (a) Write the salient features of 80286. 4

(b) Discuss the basic features of RISC Processors. 4

7. Describe Hepatic Coma. Explain in detail causes, symptoms and dietary modifications for a person suffering from hepatic coma. 8

हेपेटिक कोमा का वर्णन कीजिए । हेपेटिक कोमा से पीड़ित व्यक्ति के लिए कारणों, लक्षणों और आहार संशोधनों को विस्तार से समझाइए ।

8. Comments on the following : 4×2=8

(a) Causes of Jaundice and Arthritis.

(b) Dietary modifications for Underweight.

निम्नलिखित पर टिप्पणियाँ कीजिए :

(अ) पीलिया और गठिया के कारण ।

(ब) कम वजन के लिए आहार में बदलाव ।

9. What do you mean by Gout ? Describe its causes and symptoms. Suggest dietary recommendations for a pregnant female suffering from Gout in detail. 8

गाउट से आपका क्या आशय है ? इसके कारणों और लक्षणों का वर्णन कीजिए । गाउट से पीड़ित गर्भवती महिला के लिए आहार संबंधी सुझाव विस्तार से बताइए ।

Roll No. ..... Total Pages : 04

GSQ/D-24 1019

DIETETICS-I

Course No. 301

Time : Three Hours] [Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting *two* questions from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

प्रत्येक इकाई से दो प्रश्न चुनते हुए, कुल पाँच प्रश्नों के उत्तर दीजिए । प्रश्न संख्या 1 अनिवार्य है । सभी प्रश्नों के अंक समान हैं ।

Compulsory Question (अनिवार्य प्रश्न)

1. Discuss the following : 2+2+2+2

(a) Full fluid diet

(b) Dietary modification during fever

(c) Dietary modification for viral hepatitis

(d) Arthritis.

निम्नलिखित पर चर्चा कीजिए :

(अ) पूर्ण तरल आहार

(ब) बुखार के दौरान आहार संशोधन

(स) वायरल हेपेटाइटिस के लिए आहार संशोधन

(द) गठिया ।

Unit I (इकाई I)

2. Describe diet therapy. What factors should be considered while adaptations of Normal diet to Soft diet and Clear fluid diet ? Discuss in detail with suitable examples. 8

आहार चिकित्सा का वर्णन कीजिए । सामान्य आहार को नरम आहार और स्पष्ट तरल आहार में बदलते समय किन कारकों पर विचार किया जाना चाहिए ? उपयुक्त उदाहरणों के साथ विस्तार से चर्चा कीजिए ।

3. Write in detail the dietary modifications for the following : 4×2=8

(a) Peptic ulcer

(b) Constipation.

निम्नलिखित के लिए आहार संशोधनों को विस्तार से लिखिए :

(अ) पेप्टिक अल्सर

(ब) कब्ज ।

4. Elaborate causes, symptoms and dietary modifications for Diarrhoea in detail. 8

डायरिया के कारणों, लक्षणों और आहार संशोधनों को विस्तार से बताइए ।

5. Describe surgical conditions. Explain in detail the principles of diet therapy suggested for pre-surgical and post-surgical conditions with suitable examples. 8

शल्य चिकित्सा स्थितियों का वर्णन कीजिए । उपयुक्त उदाहरणों के साथ शल्य चिकित्सा से पहले और शल्य चिकित्सा के बाद की स्थितियों के लिए सुझाए गए आहार चिकित्सा के सिद्धांतों को विस्तार से समझाइए ।

Unit II (इकाई II)

6. (a) Define and differentiate Overweight and Obesity.

अधिक वजन और मोटापे को परिभाषित कीजिए और उनमें अंतर कीजिए ।

(b) Write in detail the dietary strategies for the management of Obesity. 4×2=8

मोटापे के प्रबंधन के लिए आहार रणनीतियों को विस्तार से लिखिए ।

9. Write short notes on the following :

(a) Counseling 4

(b) Therapy. 4

निम्नलिखित पर संक्षिप्त टिप्पणियाँ लिखिए :

(अ) परामर्श

(ब) चिकित्सा ।

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GSQ/D-24 **1021**

EARLY CHILDHOOD EDUCATION AND CHILDREN WITH SPECIAL NEEDS

BTT-402-E

Time : Three Hours] [Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting *two* questions from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

प्रत्येक इकाई में से दो प्रश्न चुनते हुए, कुल पाँच प्रश्नों के उत्तर दीजिए । प्रश्न संख्या 1 अनिवार्य है । सभी प्रश्नों के अंक समान हैं ।

Compulsory Question (अनिवार्य प्रश्न)

1. Write short notes on the following : 2×4=8

(a) Explain the needs of children with special needs

(b) Difference between day care centers and play centers

(c) Explain the importance of nursery school education

(d) Types and causes of speech disorder.

निम्नलिखित पर संक्षिप्त टिप्पणियाँ लिखिए :

(अ) विशेष आवश्यकता वाले बच्चों की जरूरतें बताइए ।

(ब) डे केयर सेंटर और प्ले सेंटर में अंतर ।

(स) नर्सरी स्कूल शिक्षा का महत्व बताइए ।

(द) भाषण विकार के प्रकार और कारण ।

Unit I (इकाई I)

2. Explain importance and scope of early childhood education. 8

प्रारंभिक बाल्यावस्था शिक्षा का महत्व और क्षेत्र बताइए ।

3. Explain the importance and principles of preschool programme. 8

प्रीस्कूल कार्यक्रम का महत्व और सिद्धांत बताइए ।

4. Discuss the philosophy of these great educationists about nursery school education :

(a) Montessori 4

(b) Tagore. 4

नर्सरी स्कूल शिक्षा के बारे में इन महान शिक्षाविदों के दर्शन पर चर्चा कीजिए :

(अ) मोंटेसरी

(ब) टैगोर ।

Unit II (इकाई II)

5. Which factors should be considered while selecting outdoor equipments for pre school children ? 8

प्री स्कूल बच्चों के लिए आउटडोर उपकरणों का चयन करते समय किन कारकों पर विचार किया जाना चाहिए ?

6. Explain the role of parents and teachers in managing the Gifted and Mentally retarded children. 8

प्रतिभाशाली और मानसिक रूप से मंद बच्चों के प्रबंधन में माता-पिता और शिक्षकों की भूमिका बताइए ।

7. Describe characteristics and causes of the physical disorders (given below) in children : 8

(a) Cerebral palsy

(b) Mental retardation.

बच्चों में शारीरिक विकारों (नीचे दिए गए) की विशेषताओं और कारणों का वर्णन कीजिए :

(अ) सेरेब्रल पाल्सी

(ब) मानसिक मंदता ।

8. Discuss various welfare programs meant for the children with special needs and also give your opinion about the effectiveness of these programs. 8

विशेष आवश्यकता वाले बच्चों के लिए विभिन्न कल्याण कार्यक्रमों पर चर्चा कीजिए और इन कार्यक्रमों की प्रभावशीलता के बारे में अपनी राय भी दीजिए ।

7. How principles of light, ventilation and aesthetics be implemented for a house ?
एक घर के लिए प्रकाश, वेंटिलेशन और सौंदर्यशास्त्र के सिद्धांतों को कैसे लागू किया जाए ?

8. Discuss the space and furniture planning for a middle-income group for different areas of a house viz : bedroom, living room, kitchen, lobby and study room.
मध्यम आय वर्ग के लिए घर के विभिन्न क्षेत्रों जैसे शयनकक्ष, बैठक कक्ष, रसोई, लॉबी और अध्ययन कक्ष के लिए स्थान और फर्नीचर योजना पर चर्चा कीजिए ।

9. Economic status affects the construction of a house. Discuss it, while emphasizing the construction material.
आर्थिक स्थिति घर के निर्माण को प्रभावित करती है । निर्माण सामग्री पर जोर देते हुए, इस पर चर्चा कीजिए ।

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GSQ/D-24 1022

HOUSING

304

Time : Three Hours] [Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting *two* questions from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.
प्रत्येक इकाई से **दो** प्रश्न चुनते हुए, कुल **पाँच** प्रश्नों के उत्तर दीजिए । प्रश्न संख्या **1** अनिवार्य है । सभी प्रश्नों के अंक समान हैं ।

Compulsory Question (अनिवार्य प्रश्न)

1. (i) Write short answers to the following :
(a) Spaciousness in a house
(b) Selection of site for constructing a house
(c) Flexibility in house plans
(d) What do you mean by EMI ?
निम्नलिखित के संक्षिप्त उत्तर लिखिए :
(अ) घर में खाली स्थान
(ब) घर बनाने के लिए स्थल का चयन
(स) गृह योजनाओं में लचीलापन
(द) ई.एम.आई. से आप क्या समझते हैं ?

(ii) Fill in the blanks :

(e) Three major areas for functionality in the kitchen are....., .

(f) Chandeliers in the centre of the ceiling can be used for.....purpose.

(g) Different signs for windows for making house plans are..... .

(h) Name four conventional building materials for the construction of a house.....,.....,....,..... .

रिक्त स्थान भरिए :

(इ) रसोई में कार्यस्थल के तीन प्रमुख क्षेत्र हैं..... ,..... ।

(फ) छत के केंद्र में झूमर का उपयोग.....उद्देश्य के लिए किया जा सकता है ।

(ग) घर की योजना बनाने के लिए खिड़कियों के लिए अलग-अलग चिन्ह.....हैं ।

(ह) घर के निर्माण के लिए चार पारंपरिक निर्माण सामग्रियों के नाम बताइए....., ... ।

Unit I (इकाई I)

2. Describe various advantages of owning a House. What are its drawbacks ?

अपना स्वयं का घर होने के विभिन्न लाभों का वर्णन कीजिए । इसकी कमियाँ क्या हैं ?

3. While constructing a house which type of material can be used for wall furnishings ? Discuss with its advantages and disadvantages.

घर बनाते समय दीवार की साज-सज्जा के लिए किस प्रकार की सामग्री का उपयोग किया जा सकता है ? इसके लाभ और हानियों पर चर्चा कीजिए ।

4. How can we arrange funds for the construction of the house ? Write in brief.

हम घर के निर्माण के लिए धन की व्यवस्था कैसे कर सकते हैं ? संक्षेप में लिखिए ।

5. Write in brief :

(a) Material for cupboards

(b) Need for a house.

संक्षेप में लिखिए :

(अ) अलमारी के निर्माण के लिए सामग्री

(ब) हमें घर की आवश्यकता किसलिए है ?

Unit II (इकाई II)

6. Name different types of house plans. Draw various signs used for doors, ventilators, stairs, electric fittings, plumbing etc.

विभिन्न प्रकार की गृह योजनाओं के नाम बताइए । दरवाजे, वेंटिलेटर, सीढ़ियों, बिजली फिटिंग, पाइपलाइन आदि के लिए उपयोग किए जाने वाले विभिन्न चिह्न बनाइए ।