GUJCET-PCE-2020

Test Booklet Set No. **07**

DO NOT open this Test Booklet until you are asked to do so.

Important Instructions :

1) The Physics and Chemistry test consists of 80 questions. Each question carries **1** mark. For each correct response, the candidate will get **1** mark. For each incorrect response ¼ mark will be deducted. The maximum marks are **80**.
2) This Test is of **2 hours** duration.
3) Use **Black Ball Point Pen only** for writing particulars on OMR Answer Sheet and marking answers by darkening the circle '●'.
4) Rough work is to be done on the space provided for this purpose in the Test Booklet only.
5) **On completion of the test, the candidate must handover the Answer Sheet to the Invigilator in the Room / Hall. The candidates are allowed to take away this Test Booklet with them.**
6) The Set No. for this Booklet is 07 . Make sure that the Set No. printed on the Answer Sheet is the same as that on this booklet. In case of discrepancy, the candidate should immediately report the matter to the Invigilator for replacement of both the Test Booklet and the Answer Sheet.
7) The candidate should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer Sheet.
8) Do not write your Seat No. anywhere else, except in the specified space in the Test Booklet / Answer Sheet.
9) Use of White fluid for correction is not permissible on the Answer Sheet.
10) Each candidate must show on demand his / her Admission Card to the Invigilator.
11) No candidate, without special permission of the Superintendent or Invigilator, should leave his / her seat.
12) Use of Simple (Manual) Calculator is permissible.
13) The candidate should not leave the Examination Hall without handing over their Answer Sheet to the Invigilator on duty and must sign the Attendance Sheet (Patrak - 01). Cases where a candidate has **not** signed the Attendance Sheet (Patrak - 01) will be deemed not to have handed over the Answer Sheet and will be dealt with as an unfair means case.
14) The candidates are governed by all Rules and Regulations of the Board with regard to their conduct in the Examination Hall. All cases of unfair means will be dealt with as per Rules and Regulations of the Board.
15) No part of the Test Booklet and Answer Sheet shall be detached under any circumstances.
16) The candidates will write the Correct Test Booklet Set No. as given in the Test Booklet / Answer Sheet in the Attendance Sheet. (Patrak - 01)

PHYSICS

1) A sine voltage having maximum value of 283 V & frequency of 50 Hz is applied to LCR series connection where R = 3Ω, L = 25.48 mH & C = 796 μF. Then impedence is _____ at resonance condition.

(A) 3Ω

(B) 5Ω

(C) 15Ω

(D) 4Ω

2) What is correct for real transformer?

(A) $P_i > P_o$

(B) $P_i < P_o$

(C) $P_i = P_o$

(D) All are correct

3) The source of displacement current is _____.

(A) Changing Magnetic Field

(B) Changing Electric Field

(C) Static Electric Field

(D) Static Magnetic Field

(Space for Rough Work)

4) The range of wavelength for Ultraviolet is from _____ to _____.

(A) 1 mm to 700 nm

(B) 0.1 m to 1 mm

(C) 700 nm to 400 nm

(D) 400 nm to 1.0 nm

5) The earth rotates on its axis takes 24 hours to complete one revolution. How much time it takes at sun from earth to have shift of 1°?

(A) 4 sec. (B) 4 hrs.

(C) 4 min. (D) 24 hrs.

6) For glass lens $f = +50$ cm. Then power of lens is _____.

(A) +2 D (B) –2 D

(C) +0.02 D (D) –0.02 D

7) A lens ($n = 1.5$) is placed in a liquid. To make it disappear, the value of n of liquid should be _____.

(A) $n < 1.5$ (B) $n = 1.5$

(C) $n > 1.5$ (D) any n

(Space for Rough Work)

8) What is the type of nature of image formed for an object placed an axis of concave mirror between pole & centre?

(A) Real, inverted & magnified

(B) Virtual, erect & diminished

(C) Real, inverted & diminished

(D) Virtual, erect & magnified

9) The distance between two slits is 3 mm & screen is placed at 2 m distance. When blue-green light of wavelength 500 nm is used then distance between two fringes will be?

(A) 0.5 mm

(B) 0.43 mm

(C) 0.33 mm

(D) 0.4 mm

10) For what distance is ray optics a good approximation when the aperture is 4 mm wide & the wavelength is 500 nm?

(A) 8 m

(B) 32 m

(C) 18 m

(D) 6 m

11) Resolving power of microscope is _____.

(A) $\frac{1.22 n \sin \beta}{2n\lambda}$

(B) $\frac{2\lambda}{1.22 n \sin \beta}$

(C) $\frac{1.22 n}{2\lambda \sin \beta}$

(D) $\frac{1.22 \lambda}{2n \sin \beta}$

(Space for Rough Work)

12) How much is the De-Broglie wavelength for an electron accelerated by an 100V potential difference?

(A) 12.3 nm
(B) 123 nm
(C) 0.123 nm
(D) 0.123 cm

13) The threshold frequency of cesium is 5.16×10^{14} Hz. Then its work-function is _____ eV.

(A) 1.12
(B) 2.14
(C) 1.14
(D) 4.12

14) The nucleus of gold is about _____ times heavier than an α-particle.

(A) 100
(B) 50
(C) 10
(D) 200

15) The ground state energy of hydrogen atom is –13.6 eV. What is the kinetic energy of electron in this state?

(A) –27.2 eV
(B) –13.6 eV
(C) +13.6 eV
(D) +27.2 eV

(Space for Rough Work)

16) The minimum wavelength for Balmer series is _____.

(A) $-\frac{36}{5R}$ (B) $\frac{9}{R}$

(C) $\frac{4}{R}$ (D) $\frac{R}{4}$

17) Calculate the energy equivalent of 1g of substance

(A) 6×10^{11} J (B) 9×10^{13} J

(C) 4×10^{12} J (D) 7×10^{12} J

18) In which process neutron is converted into proton?

(A) β^- decay (B) β^+ decay

(C) α - decay (D) γ decay

19) The Forbidden gap between conduction band & valance band is maximum for _____.

(A) Semiconductor (B) Insulator

(C) Metal (D) Superconductor

(Space for Rough Work)

20) The below truth table is for which gate?

Input		Output
A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

(A) NOR

(B) AND

(C) OR

(D) NAND

21) For a pure Si crystal has 5×10^{28} atom m^{-3}. It is doped by 1 PPM concentration of pentavalent As. Calculate the number of electron & holes.

Given that ni = $1.5 \times 10^{16}\ m^{-3}$

(A) $4.5 \times 10^{-9}\ m^{-3}$

(B) $5.4 \times 10^{9}\ m^{-3}$

(C) $4.5 \times 10^{9}\ m^{-3}$

(D) $5.4 \times 10^{-9}\ m^{-3}$

(Space for Rough Work)

22) In diode, Increasing the Forward voltage, the thickness of depletion layer _____.

(A) Decreases

(B) Does not change

(C) Increases

(D) Cannot be decided

23) If charge q is placed on one of the vertex of a cube. Then flux passing through any one surface of cube is _____.

(A) $\frac{q}{\varepsilon_0}$

(B) $\frac{q}{6\varepsilon_0}$

(C) $\frac{q}{24\varepsilon_0}$

(D) None of these

24) Two point electric charges $+10^{-8}$ C and -10^{-8} C are placed 0.1 m apart. Find the magnitude of Total Electric Field at the center of the line joining the two charges.

(A) Zero

(B) $3.6 \times 10^4\ NC^{-1}$

(C) $7.2 \times 10^4\ NC^{-1}$

(D) $12.96 \times 10^4\ NC^{-1}$

(Space for Rough Work)

25) The charge density of uniformly charged infinite plane is σ. A simple pendulum is suspended vertically downward near it. Charge q_0 is placed on metallic bob. If the angle made by the string is θ with vertical direction then _____.

(A) $\sigma \propto \tan\theta$

(B) $\sigma \propto \frac{\tan\theta}{q_0}$

(C) $\sigma \propto \frac{\cot\theta}{q_0}$

(D) $\sigma \propto \frac{q_0}{\tan\theta}$

26) The dimensional formula of Polarization P is _____.

(A) $L^2 A^{-1} T^{-1}$

(B) $M^1 L^{-2} A^1 T^1$

(C) $L^{-2} A^{-1} T^{-1}$

(D) $L^{-2} A^1 T^1$

27) If relative permittivity for any substance is 80 then its electric susceptibility is _____.

(A) 79

(B) 7×10^{-10}

(C) 7×10^{-9}

(D) 81×10^{-10}

(Space for Rough Work)

28) $2\mu F$ capacitor is connected with 50V supply & $3\mu F$ capacitor is connected with 100V supply. Now after removing battery if two plates of same type of charges are placed to form new capacitor then potential difference is _____ V.

(A) 200 (B) 333

(C) 80 (D) 75

29) The emf of a car battery is 12V of internal resistance of battery is 0.4Ω then maximum power drawn from battery is _____ W.

(A) 4.8 (B) 360

(C) 30 (D) Zero

30) The resistance of the platinum wire of a platinum resistance thermometer at a ice point is 5Ω & at steam point is 5.23 Ω. When the thermometer is inserted in a hot bath, the resistance of a platinum wire is 5.795 Ω. Calculate the temperature of the bath.

(A) 345.65 °C (B) 365.65 °C

(C) 354.56 °C (D) 245.65 °C

31) One electric cell (having emf of 2V & internal resistance of 0.1Ω) and other electric cell (having emf of 4V & internal resistance of 0.2 Ω) are connected in parallel to each other. Then its equivalent emf will be _____ V.

(A) 1.33 (B) 2.57

(C) 2.67 (D) 0.38

(Space for Rough Work)

32) The source of magnetic field is _____ & source of electric field is _____.

(A) scalar, vector

(B) scalar, scalar

(C) vector, vector

(D) vector, scalar

33) A coil having 10 Am^2 magnetic moment is placed in a vertical plane & is free to rotate about its horizontal axis coincides with its diameter. A uniform magnetic field of 2T in the horizontal direction exists such that initially the axis of the coil is in the direction of the field. The coil rotates through an angle of 90° under the influence of magnetic field. The moment of Inertia of coil is 0.1 kg m^2. What will be its angular speed?

(A) 20 rad/s

(B) 10 rad/s

(C) 5 rad/s

(D) 40 rad/s

34) 10 A current is passing through a very long wire of radius 5 cm. Then magnetic field at a distance of 2 cm inside from its curved surface is _____ $\times 10^{-5}$ T.

(A) 2.4×10^{5}

(B) 6.7×10^{-5}

(C) 2.4×10^{-5}

(D) 2.4

(Space for Rough Work)

35) In India Declination at Delhi is _____.

(A) 0° 58' E

(B) 0°41' W

(C) 0°41' E

(D) 0° 58' W

36) The relative permeability in a core of a solenoid is 400. The windings of a solenoid are insulated from the core and carry a current of 2A. If the number of turns is 1000 per meter. Then magnetic Intensity inside the core of solenoid is _____ A/m.

(A) 2.5×10^{3}

(B) 2×10^{3}

(C) 2.5×10^{-3}

(D) 2×10^{-3}

37) The coil having 1000 turns & Area of 0.10 m^2 rotates at half a revolution per second & it is placed in a uniform magnetic field of 0.01 T perpendicular to the axis of rotation of coil. Then max emf voltage generated in coil is _____V.

(A) 3.14

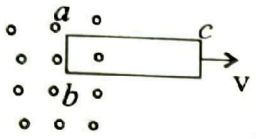
(B) 5.0

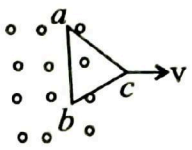
(C) 0.5

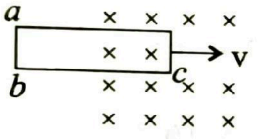
(D) 0.314

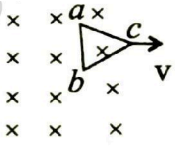
(Space for Rough Work)

38) Out of the following given loops in which loop, the direction of induced current is from $a \rightarrow c \rightarrow b$.

(A) 

(B) 

(C) 

(D) 

39) Which is not the unit of Inductance?

(A) H

(B) $V.s.A^{-1}$

(C) WbA^{-1}

(D) $Wb.s.A^{-1}$

40) A bulb of 100 W rating is connected with 220 V supply. The resistance of bulb is _____.

(A) 2.2 Ω

(B) 484 $\Omega\, m^{-1}$

(C) 484 Ω

(D) $2.2 \times 10^{-3}\ \Omega\, m^{-1}$

(Space for Rough Work)

41) The divalent ion of which of the following element in aqueous solution has magnetic moment 5.92 BM?

(A) Fe (B) Cr

(C) Co (D) Mn

42) Although Zirconium belongs to 4d-transition series and Hafnium belongs to 5d transition series, even then they show similar physical and chemical properties because _____.

(A) Both have similar atomic radius

(B) Both have same number of electrons

(C) Both belongs to d-block

(D) Both belongs to the same group of the periodic table

43) Which isomerism is possible in hexa ammine cobalt (III) hexa cyanido chromate (III) complex?

(A) Ionisation isomerism

(B) Co-ordination isomerism

(C) Linkage isomerism

(D) Solvate isomerism

(Space for Rough Work)

44) Which of the following complex will absorb maximum wavelength of light?

(A) $[Co(NH_3)_6]^{3+}$ (B) $[Co(NH_3)_5(H_2O)]^{3+}$

(C) $[CoCl(NH_3)_5]^{2+}$ (D) $[Co(CN)_6]^{3-}$

45) The complex having highest electrical conductivity in aqueous solution under similar conditions is _____.

(A) Tetra aqua dichlorido cobalt (III) chloride

(B) Triaqua trichlorido cobalt (III)

(C) Penta aqua chlorido cobalt (III) chloride

(D) Hexa aqua cobalt (III) chloride

46) How many optically active isomers are possible in the compound having formula C_4H_9Br?

(A) 1 (B) 2

(C) 3 (D) 4

47) $R'-Cl \xrightarrow{Na/ether}$ 2, 3 - dimethyl butane. What is R' in the above reaction?

(A) sec-butyl

(B) isobutyl

(C) isopropyl

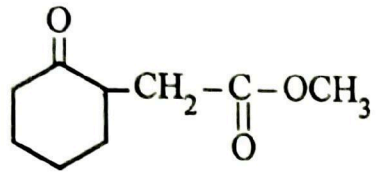
(D) n-propyl

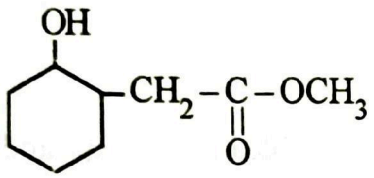
(Space for Rough Work)

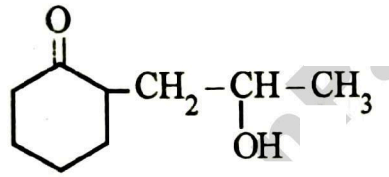
48) 1 mole of metal 'M' reacts completely with alcohol to give 1.5 moles of H_2. Then what will be the valency of metal 'M'?

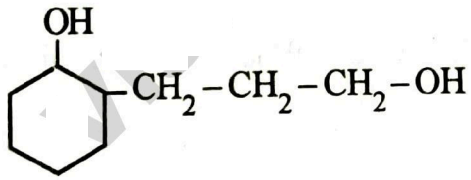
(A) 2 (B) 3

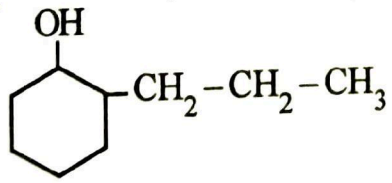
(C) 4 (D) 1

49)  "X". What is "X" in the reaction?

(A) 

(B) 

(C) 

(D) 

(Space for Rough Work)

50) Which of the following has highest boiling point?

(A) Pentanal

(B) Ethoxy ethane

(C) n-Butane

(D) Pentan - 1 - ol

51) Which reagent is required to convert cyclohexanol to cyclohexanone?

(A) Anhydrous CrO_3

(B) O_3/H_2O - Zn dust

(C) PCC

(D) DIBAL-H

52) Which of the following acid has highest pKa value?

(A) FCH_2COOH

(B) O_2NCH_2COOH

(C) $NCCH_2COOH$

(D) $C_6H_5CH_2COOH$

(Space for Rough Work)

53) $C_6H_5CH_2 - MgBr \xrightarrow[(2)\ H_3O^+]{(1)\ CO_2/ether} 'X' \xrightarrow[\Delta]{NaOH + CaO} 'Y'$? What is the final product in this reaction?

(A) C_6H_6

(B) $C_6H_5CH_2CH_3$

(C) $C_6H_5CH_3$

(D) $C_6H_5CH_2OH$

54) Which of the following compound has least Basic strength?

(A) $(C_2H_5)_2NH$

(B) $C_6H_5NH_2$

(C) NH_3

(D) $C_2H_5NH_2$

55) The source of nitrogen in Gabriel synthesis of amines is _____.

(A) $C_6H_4(CO)_2N^-K^+$

(B) NaN_3

(C) KCN

(D) $NaNO_2$

56) The best reagent for converting 2-Phenyl propanamide into 1-Phenyl ethanamine is _____.

(A) $LiAlH_4$

(B) $NaBH_4$

(C) H_2/Pt

(D) $NaOH/Br_2$

(Space for Rough Work)

57) Giving 'T' symbol for true statement and 'F' symbol for false statement, select the correct option

(i) Most naturally occuring amino acids have L-configuration

(ii) β-D-ribose sugar is present in RNA

(iii) Amylose is water insoluble component made up of α – D – (+) glucose units.

(iv) All monosaccharides are non-reducing sugars.

(A) TTFT
(B) TTFF
(C) TFTF
(D) FTTF

58) Which amino acids are used in the preparation of Nylon - 2 - Nylon 6?

(A) Amino Caproic acid and glycine

(B) Phenol and Formaldehyde

(C) Phthalic acid and glycine

(D) Ethylene glycol and Phthalic acid

59) Zeiglar Natta catalyst is a mixture of _____.

(A) $TiCl_3$ & $(C_2H_5)_4Al$

(B) $TiCl_4$ & $(C_2H_5)_2Al$

(C) $TiCl_2$ & $(C_2H_5)_3Al$

(D) $(C_2H_5)_3Al$ & $TiCl_4$

(Space for Rough Work)

60) Which antihistamine drug is used to prevent acidity?

(A) Morphine

(B) Phenelzine

(C) Cimetidine

(D) Equanil

61) Name the sweetner which is a trichloro derivative of Sucrose?

(A) Alitame

(B) Sucralose

(C) Saccharin

(D) Aspartame

62) The deficiency of which vitamin causes scurvy?

(A) Ascorbic acid

(B) Riboflavin

(C) Thiamine

(D) Pyridoxine

(Space for Rough Work)

63) Which of the following statement is correct?

(A) In the unit cell of rhombic Sulphur, the axial distances are equal and the value of each axial angle is 90°

(B) Amorphous solids are anisotropic in nature

(C) Silicon doped with Arsenic impurity is a p-type semiconductor

(D) In MnO, all the domains are aligned in the same direction

64) What are the fractions of Fe^{2+} and Fe^{3+} in $Fe_{0.93}O$ respectively?

(A) 0.75, 0.25 (B) 0.85, 0.15

(C) 0.93, 0.07 (D) 0.80, 0.20

65) Maximum amount of a solid solute that can be dissolved in a specified amount of a given liquid solvent does not depend upon _____.

i) Temperature

ii) Nature of solute

iii) Pressure

iv) Nature of Solvent

(A) (ii) & (iv) (B) (ii)

(C) (i) & (iii) (D) (iii)

66) The molality of aqueous solution of any solute having mole fraction 0.25 is _____.

(A) 33.33 m (B) 16.67 m

(C) 18.52 m (D) 9.26 m

(Space for Rough Work)

67) The osmotic pressure of 0.5 M aqueous solution of CH_3COOH having 2pH at temperature T is _____.

(A) 0.51 RT
(B) 1.02 RT
(C) 0.051 RT
(D) 0.102 RT

68) On the basis of the given following electrode potentials, which one is the strongest reducing agent?

$E^{\circ}_{Cr_2O_7^{2-}|Cr^{3+}} = 1.33\,V$
$E^{\circ}_{MnO_4^-|Mn^{2+}} = 1.51\,V$
$E^{\circ}_{Br_2|Br^-} = 1.09\,V$
$E^{\circ}_{Zn^{2+}|Zn} = -0.76\,V$

(A) Br^-
(B) Mn^{2+}
(C) Cr^{3+}
(D) Zn

69) For which of the following electrolytes the graph of $\wedge_m$ against $\sqrt{C}$ gives a negative slope.

(A) Ammonium hydroxide
(B) Sodium acetate
(C) Acetic acid
(D) Water

70) On electrolysis of aqueous solution of a halide of a metal 'M' by passing 1.5 ampere current for 10 minutes deposits 0.2938 g of metal. If the atomic mass of the metal is 63 gm/mole, then what will be the formula of the metal halide?

(A) MCl
(B) MCl_3
(C) MCl_2
(D) MCl_4

(Space for Rough Work)

71) In the presence of a catalyst, the heat evolved or absorbed during the reaction ___.

(A) May decrease or increase
(B) Increases
(C) Decreases
(D) Remains unchanged

72) Which of the following graph has intercept equal to zero?

(A) $\log K \rightarrow \frac{1}{T}$
(B) $\log \frac{[R]_0}{[R]} \rightarrow t$
(C) $\log[R] \rightarrow t$
(D) $[R] \rightarrow t$

73) Time required to decompose SO_2Cl_2 to half of its initial amount is 40 minutes. If the decomposition is a first order reaction, What will be the rate constant of the reaction?

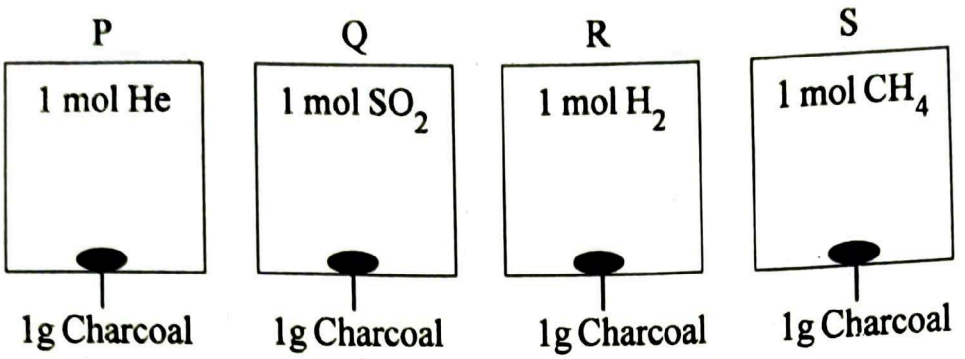
(A) $2.88 \times 10^{-4}\ s^{-1}$
(B) $2.88 \times 10^{-2}\ s^{-1}$
(C) $1.73 \times 10^{-2}\ s^{-1}$
(D) $1.73 \times 10^{-4}\ s^{-1}$

74) Which of the following is a reversible sol?

(A) $Fe(OH)_3$ sol
(B) As_2S_3 sol
(C) Gelatin sol
(D) Gold sol

(Space for Rough Work)

75) From the figure, in which of the following vessel, the pressure of the gas is the highest. [Temperature and volume of the gases are the same in each vessel].



(A) R (B) P

(C) Q (D) S

76) Which soluble complex is formed in the leaching process of Gold?

(A) $[Au(OH)_4]^{2-}$

(B) $[Au(CN)_4]^{2-}$

(C) $[Au(OH)_2]^-$

(D) $[Au(CN)_2]^-$

77) Which of the following slag is formed during the extraction of iron in the blast furnace?

(A) $CaSiO_3$ (B) $FeCO_3$

(C) $CaCO_3$ (D) $FeSiO_3$

(Space for Rough Work)

78) Which of the following is the correct order?

(A) Ionic character : $MF < MCl < MBr < MI$

(B) Stability : $HI < HBr < HCl < HF$

(C) Acidic Strength : $HClO_4 < HClO_3 < HClO_2 < HClO$

(D) Electron gain enthalpy : $I < Br < Cl < F$

79) In which of the following oxoacid of Sulphur, S–O–O–S bond is present?

(A) $H_2S_2O_4$ (B) $H_2S_2O_8$

(C) $H_2S_2O_7$ (D) $H_2S_2O_3$

80) Concentrated HNO_3 oxidise white phosphorus into which substance?

(A) H_3PO_4 (B) $H_4P_2O_7$

(C) H_3PO_2 (D) H_3PO_3

(Space for Rough Work)