FIITJEE
ALL INDIA TEST SERIES
JEE (Advanced)-2025
FULL TEST – III
PAPER –2
TEST DATE: 18-02-2025

Time Allotted: 3 Hours **Maximum Marks: 180**

General Instructions:

- The test consists of total 51 questions.
- Each subject (PCM) has 17 questions.
- This question paper contains **Three Parts.**
- **Part-I** is Physics, **Part-II** is Chemistry and **Part-III** is Mathematics.
- Each **Part** is further divided into **Three Sections**: **Section-A, Section-B & Section-C**.
  Section – A *(01 – 04, 18 – 21, 35 – 38):* This section contains **TWELVE (12)** questions. Each question has **FOUR** options. **ONLY ONE** of these four options is the correct answer.
  Section – A *(05 –07, 22 – 24, 39 – 41):* This section contains **NINE (09)** questions. Each question has **FOUR** options. **ONE OR MORE THAN ONE** of these four option(s) is(are) correct answer(s).
  Section – B *(08 – 13, 25 – 30, 42 – 47):* This section contains **EIGHTEEN (18)** numerical based questions. The answer to each question is a **NON-NEGATIVE INTEGER VALUE**.
  Section – C *(14 –17, 31 – 34, 48 – 51):* This section contains **SIX (06) paragraphs.** Based on each paragraph, there are **TWO (02)** questions of numerical answer type. The answer to each question is a **NUMERICAL VALUE (XXXXX.XX).** If the numerical value has more than two decimal places, truncate/round-off the value to **TWO** decimal places.

MARKING SCHEME

Section – A (Single Correct): Answer to each question will be evaluated according to the following marking scheme:

Full Marks	:	+3	If ONLY the correct option is chosen.
Zero Marks	:	0	If none of the options is chosen (i.e. the question is unanswered);
Negative Marks	:	–1	In all other cases.

Section – A (One or More than One Correct): Answer to each question will be evaluated according to the following marking scheme:

Full Marks	:	+4	If only (all) the correct option(s) is (are) chosen;
Partial Marks	:	+3	If all the four options are correct but ONLY three options are chosen;
Partial marks	:	+2	If three or more options are correct but ONLY two options are chosen and both of which are correct;
Partial Marks	:	+1	If two or more options are correct but ONLY one option is chosen and it is a correct option;
Zero Marks	:	0	If none of the options is chosen (i.e. the question is unanswered);
Negative Marks	:	–2	In all other cases.

Section – B: Answer to each question will be evaluated according to the following marking scheme:

Full Marks	:	+4	If ONLY the correct integer is entered;
Zero Marks	:	0	Question is unanswered;
Negative Marks	:	0	In all other cases.

Section – C: Answer to each question will be evaluated according to the following marking scheme:

Full Marks	:	+3	If ONLY the correct integer is entered;
Zero Marks	:	0	Question is unanswered;
Negative Marks	:	0	In all other cases.

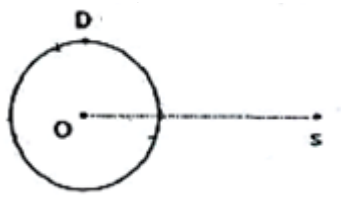
Physics

PART – I

SECTION – A
(One Options Correct Type)

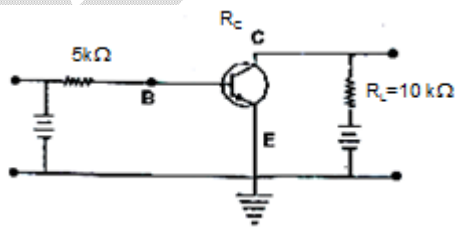
*This section contains **FOUR (04)** questions. Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is the correct answer.*

1. A sound detector D moves with constant speed on a circle of radius R and centre at O in xy plane. A point source of sound S lies in xy plane at distance 2R from the point O and emits sound of a given frequency. The ratio of maximum frequency and minimum frequency recorded by the detector is 11/9 and speed of sound is 340 m/s. The minimum time interval in seconds between recording a maximum frequency and minimum frequency is (Take R = 17 m)



(A) 3 (B) $\pi/3$
(C) $\pi/2$ (D) $2\pi/3$

2. The adjoining diagram shows the biasing of an non transistor in common emitter configuration used in an amplifier. The design of the transistor is such that 98% of the charge carriers passing through the emitter reach the collector. If base current changes from 50 μA to 100 μA, then the corresponding change in the voltage across the load resistance R_L will be



(A) 0.25 V (B) 0.5 V
(C) 24.5 V (D) 49.0 V

3. In the shown figure (1) and (2), capacitors are in the steady state. Charging batteries are removed and switches S_1 and S_2 are closed at the t = 0. The plot of $\ell n I$ (I is the current in the resistor) in against time t in the resistor R_1 and R_2 are shown by the graphs 1 and 2 respectively in the figure (3). Choose the incorrect option.

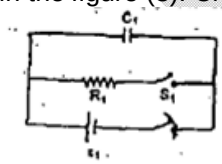


figure (1)

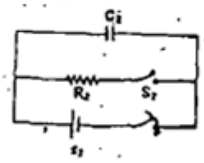


figure (2)

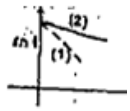
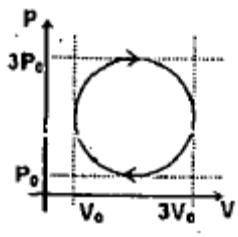


figure (3)

(A) If $\varepsilon_1 = 2\varepsilon_2, R_1$ must be equal to $2R_2$ (B) If $R_1 = R_2$, C_1 must be less than C_2
(C) If $C_1 = C_2$, R_1 must be less than R_2 (D) R_1C_1 is equal to R_2C_2

4. An ideal gas undergoes a circular cycle as shown in the figure. Find the radio of maximum temperature of cycle to minimum temperature of cycle.



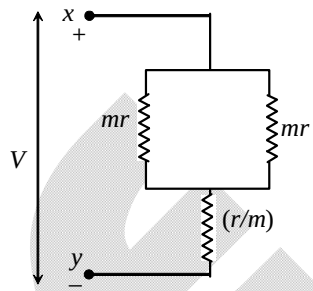
(A) $\left(\frac{1+\sqrt{2}}{\sqrt{2}-1}\right)^2$ (B) $\left(\frac{2+\sqrt{2}}{2-\sqrt{2}}\right)^2$
(C) $\left(\frac{3+\sqrt{2}}{3-\sqrt{2}}\right)^2$ (D) $\left(\frac{4+\sqrt{2}}{4-\sqrt{2}}\right)^2$

SECTION – A

(One or More than one correct type)

*This section contains **THREE (03)** questions. Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four option(s) is (are) correct answer(s).*

5. In the given circuit the value of m is varying. The correct statements about the circuit are



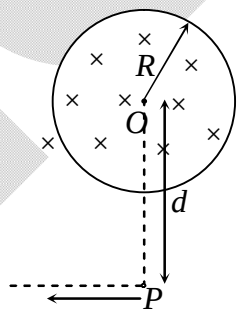
(A) The condition for maximum current flowing from x is $m = 2$.

(B) The maximum current is $\frac{V}{\sqrt{2}r}$.

(C) The condition for maximum current flowing from x is $m = \sqrt{2}$.

(D) The maximum current is $\frac{3V}{2r}$.

6. In a cylindrical region of radius R, there exists a time varying magnetic field B such that $\frac{dB}{dt} = k(>0)$. A charged particle having charge q is placed at the point P at a distance d (> R) from its centre O. Now, the particle is moved in the direction perpendicular to OP (see figure) by an external agent upto infinity so that there is no gain in kinetic energy of the charged particle. Choose the correct statement/s.



(A) Work done by external agent is $\frac{q\pi R^2}{4}k$ if $d = 2R$

(B) Work done by external agent is $\frac{q\pi R^2}{8}k$ if $d = 4R$

(C) Work done by external agent is $\frac{q\pi R^2}{4}k$ if $d = 4R$

(D) Work done by external agent is $\frac{q\pi R^2}{4}k$ if $d = 6R$

7. When photons of energy 4.25 eV strike the surface of a metal A, the ejected photoelectrons have maximum kinetic energy T_A eV and de Broglie wavelength λ_A. The maximum kinetic energy of photoelectrons liberated from another metal B by photons of energy 4.70 eV is $T_B = (T_A - 1.50)$ eV. If the de Broglie wavelength of these photoelectrons is $\lambda_B = 2\lambda_A$, then

(A) the work function of A is 1.25 eV (B) the work function of B is 4.20 eV

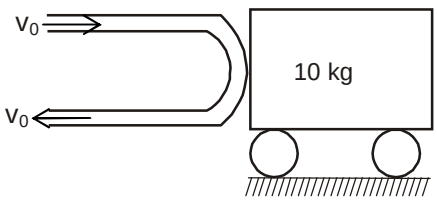
(C) T_A = 3.00 eV (D) T_B = 1.5 eV

SECTION – B

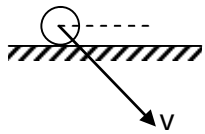
(Numerical Answer Type)

*This section contains **SIX (06)** Numerical based questions. The answer to each question is a **NON-NEGATIVE INTEGER VALUE**.*

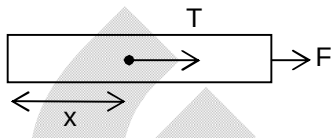
8. In the figure shown if the cart is frictionless and free to move in horizontal direction, cross-section area of jet = 2×10^{-4} m^2, velocity of jet v_0 = 7.5 m/sec, density of liquid = 1000 kg/m^3, mass of cart is 10 kg. If initially the card is at rest. If the velocity of cart at t = 10 sec is 1.1 x. Then x is



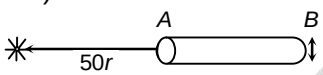
9. A ball hits a horizontal floor (ground) with a velocity $\vec{v} = 6\hat{i} - 8\hat{j}$ m. If the ground is smooth, if the speed of motion just after the collision is $\sqrt{\frac{100}{k}}$ $\left(\text{put } e = \frac{1}{2}\right)$. Find the value of k.



10. A smooth uniform string of natural length l, cross-sectional area A and Young's modulus Y is pulled along its length by a force F on a horizontal surface. The elastic potential energy stored in the string is $V = \frac{0.17F^2 l}{AY}P$. Then P is



11. A cylindrical rod of length $l = 64$ cm and cross-sectional radius $r = \left(2/\sqrt{\pi}\right)$ cm is placed at a distance 50 *r* from a infrared point source *S* of power 1.25 kW as shown in the figure. The lateral surface of the rod is perfectly insulated from the surroundings. The cross-section A absorbs 80% of the incident energy, has temperature T_A in steady state. The surface *B* is radiating energy into space and the wavelength emitted by it with maximum energy density is 100,000 Å. Determine the temperature of end *B* and find the value of T_A if conductivity varies with temperature as $K = \frac{T}{T_A}$. Assume that the rate of flow of heat through the rod is steady. (Wein's constant = 0.003 mK)



12. Initial velocities of masses separated by 'a' are shown in figure. The maximum separation between them during motion is $r = \frac{4Gma}{4gm - kv_0^2 a}$, where value of k is?

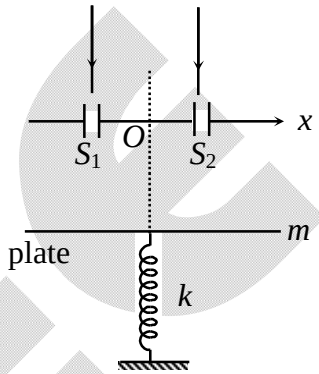
13. Two particles *A* and *B* are separated from each other by a distance *l*. At time *t* = 0, particle *A* starts moving with uniform acceleration *a* along line perpendicular to initial line joining *A* and *B*. At the same moment, particle *B* starts moving with acceleration of constant magnitude *b* such that particle *B* always points towards the instantaneous position of *A*. (*b* > *a*). Find the distance (in m) travelled by *B* till the moment *B* converges with *A*. (Take *b* = 3 m/s^2, *a* = 1 m/s^2 and *l* = 8 m)

SECTION – C
(Numerical Answer Type)

*This section contains **TWO (02) paragraphs.** Based on each paragraph, there are **TWO (02)** questions of numerical answer type. The answer to each question is a **NUMERICAL VALUE (XXXXX.XX).** If the numerical value has more than two decimal places, truncate/round-off the value to **TWO** decimal places.*

Paragraph for Question Nos. 14 and 15

Two slits S_1 and S_2 lie on the x-axis and symmetric with respect to y-axis are illuminated by a parallel monochromatic light beam of wavelength λ as shown. The distance between slits is d (>> λ). Point O is the mid point of the line S_1S_2 and this point is considered as the origin. The slits are in horizontal plane. The interference pattern is observed on a horizontal plate (acting as screen) of mass m which is connected to one end of a vertical massless spring of spring constant k. The other end of the spring fixed to ground. At t = 0, the plate is at a distance D (>> d) below the plane of slits and spring is in its natural length. The plate is released from rest from its initial position.



14. The rate by which fringe, width will increase when acceleration of plate is zero, is $\frac{\lambda g}{nd}\sqrt{\frac{m}{k}}$, find the value of n

15. The difference between two fringe widths when plate is at rest for a moment is $\frac{4\lambda mg}{ndk}$, find the value of n

Paragraph for Question Nos. 16 and 17

In a photoelectric effect, a point source of green light of power 40 W emits mono-energetic photons that can just emit photoelectrons from an isolated metallic sphere of radius r = 1 cm, placed at a distance of 1m from the light source. Now, four other separate sources of violet, blue, red and yellow light emitting same number of photons as that of green light are brought near the source of green light.
Assume one photoelectron is emitted out of every 10^6 incident photons on sphere.
(Take λ_{violet} = 4136 Å, λ_{blue} = 5000 Å, λ_{red} = 7200 Å, λ_{green} = 4963 Å, hc = 12408 eV Å)

16. The potential of the sphere when emission of photoelectrons will stop is

17. The time in (ms) after which the emission of photoelectron will stop is

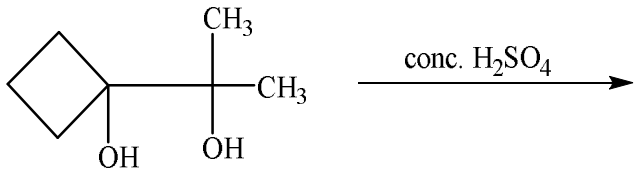
Chemistry

PART – II

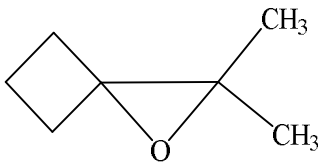
SECTION – A
(One Options Correct Type)

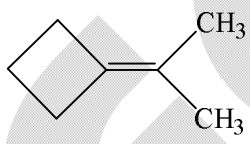
*This section contains **FOUR (04)** questions. Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is the correct answer.*

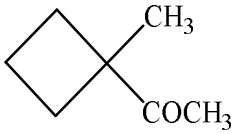
18. In the reaction

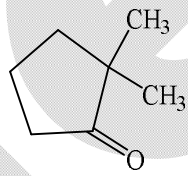


(A). The product (A) is

(A) 

(B) 

(C) 

(D) 

19. Ge(II) compounds are powerful reducing agents, whereas Pb(IV) compounds are strong oxidants. It can be due to
(A) lead is more electropositive than germanium.
(B) the ionization potential of lead is less than that of germanium.
(C) the ionic radii of Pb^{2+} and Pb^{4+} are larger than those of Ge^{2+} and Ge^{4+}
(D) in lead the inert pair effect in more pronounced than in germanium.

20. While testing BO_3^{3-}, there is green-edged flame on heating the salt with conc H_2SO_4 and CH_3OH. Green colour is of
(A) $(CH_3)_3B$ (B) $(CH_3O)_3B$
(C) B_2O_3 (D) H_3BO_3

21. In Van-Arkel method, if I_2 is introduced at 1700 K over impure metal, the product will be
(A) Iodide of the metal (B) No reaction takes place
(C) Impurities react with iodine (D) None of these

SECTION – A
(One or More than one correct type)

*This section contains **THREE (03)** questions. Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four option(s) is (are) correct answer(s).*

22. One mole of an ideal diatomic gas $\left(C_v = 5\ \text{cal}\,K^{-1}\text{mol}^{-1}\right)$ changes its state from state 1 $\left(27^oC\,1\,L\right)$ to state 2 (127ºC, 10 L). For this process, which of the following is(are) correct?
(Given : R = 2 cal K^{-1} mol^{-1})
(A) $\Delta H = 700\,\text{cal}$
(B) $\Delta U = 500\,\text{cal}$
(C) $\Delta S = 5\ln\left(\frac{4}{3}\right) + 2\ln 10\ \text{cal}\,K^{-1}$
(D) ΔG of the process can't be calculated using given information

23. 1 mole of a non-volatile non-dissociative solid solute is dissolved in 200 moles of water. The solution is taken to a temperature T_K (lower than freezing point of solution) to cause ice formation. After removal of ice the remaining solution is taken to 373 K where vapour pressure is observed to be 740 mm of Hg. Identify the correct options:
Given date: $K_f(H_2O) = 2$ K kg mol^{-1} and normal boiling point of $H_2O = 373$ K.
(A) 163 moles of ice will be formed.
(B) Temperature to which original solution was cooled should be $\frac{2000}{37\times 18}$K.
(C) Freezing point of original solution should be $-\frac{10}{18}{}^{o}C$.
(D) Relative lowering of vapour pressure of final solution will be $\frac{1}{201}$.

24. Which of the following is characteristic of chemisorptions?
(A) It is irreversible
(B) It is specific
(C) It is multilayer phenomenon
(D) Heat of adsorption is about –400 kJ

SECTION – B

(Numerical Answer Type)

*This section contains **SIX (06)** Numerical based questions. The answer to each question is a **NON-NEGATIVE INTEGER VALUE**.*

25. An organic compound undergoes first order decomposition. The time taken for decomposition to $\frac{1}{8}$ and $\frac{1}{10}$ of its initial concentration are $t_{1/8}$ and $t_{1/10}$ respectively. What is the value of $\frac{[t_{1/8}]}{[1_{1/10}]}\times 10$? (take $\log_{10} 2 = 0.3$)

26. A straight chain organic compound $C_3H_8O_3$ yields $C_9H_{14}O_6$ on complete acetylation. The number of hydroxyl groups in $C_3H_8O_3$

27. Ice crystallizes in a hexagonal lattice. At a certain low temperature the lattice constants are $a = 4.53\text{Å}$ and $c = 7.41\text{Å}$. The number of H_2O molecules contained in a unit cell:
($d \approx 0.92$ g cm^{-3} at the given temperature)

28. A mixture of two immiscible liquids nitrobenzene and water boiling at 99ºC has a partial pressure of water 733 mm and of nitrobenzene 27 mm. The ratio of weights of water and nitrobenzene in mixture is.....

29. The electrolytic reduction of 300 mL of 0.01M nitroalkane was carried out in acidic buffer medium of pH 5.0 following the change:
$RNO_2 + 4H_3O^+ + 4e \longrightarrow RNHOH + 5H_2O$
If the total concentration of weak acid and its conjugate base was 0.50 M, calculate the pH of solution after completion of reduction. If it is x + 0.0455, find the value of x. K_a for weak acid is 1.8×10^{-5}.

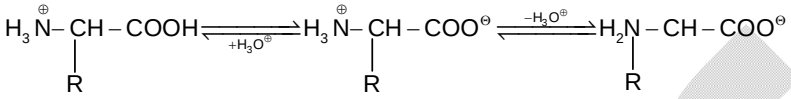
30. The number of Stereoisomers of 1, 2, 4-trimethylcyclohexane will be?

SECTION – C
(Numerical Answer Type)

*This section contains **TWO (02) paragraphs.** Based on each paragraph, there are **TWO (02)** questions of numerical answer type. The answer to each question is a **NUMERICAL VALUE (XXXXX.XX).** If the numerical value has more than two decimal places, truncate/round-off the value to **TWO** decimal places.*

Paragraph for Question Nos. 31 and 32

Amino acids contain both a basic group ($-NH_2$) and an acidic group ($-CO_2H$). In the dry solid state, amino acids exist as dipolar ions, a form in which the carboxylic group is present as a carboxylate ion, $-CO_2^-$ and the amino group is present as on ammonium ion, $-NH_3^{\oplus}$. In aqueous solution, an equilibrium exists between the dipolar ion (zwitter ions) and the anionic and cationic forms of an amino acid.



Cationic form (K_{a_1}) Dipolar ion (K_{a_2}) (Zwitter ion) Anionic form

In strongly acidic solution $(pH \approx 0)$ all amino acids are present primarily as cations, in strongly basic solution they are present as anions. At some intermediate pH, called the isoelectric point (pI), the concentration of the anions and cations is equal. Each amino acid has particular isoelectric point.

31. For the phenyl alanine, the first and second dissociation constants are given as $pKa_1 = 1.8$ and $pKa_2 = 9.1$. What will be the pH at isoelectric point?

32. The formula of lysine is $H_2N(CH_2)_3$. $CH_2-CH(NH_2)-COOH$ for lysine the value of pK_{a_1}, pK_{a_2} and pK_{a_3} are 2.2, 9.0 and 10.5 respectively. The pH at isoelectric point of lysine is

Paragraph for Question Nos. 33 and 34

The adiabatic compression of a mixture of 2 volumes of Hydrogen and 1 volume of oxygen from 320 ml of 10 ml caused explosion. The initial pressure and temperature of the gaseous mixture were 1 atm and 27ºC

33. What is the temperature of the gaseous mixture at the moment of explosion?

34. What is the magnitude of maximum work (in joules) performed by the gaseous mixture before explosion?

Mathematics

PART – III

SECTION – A
(One Options Correct Type)

*This section contains **FOUR (04)** questions. Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is the correct answer.*

35. If 2a + 2b + 3c = 1/5, and a, b, c > 0 then maximum value of constant term is expansion of $\left(ab\sqrt{x}+\frac{c}{\sqrt[3]{x}}\right)^{25}$ is

(A) $^{25}C_{10}$ (B) $^{25}C_{15}\,(35)^{25}$

(C) $^{25}C_{15}\left(\frac{1}{35}\right)^{35}$ (D) $^{25}C_{10}\left(\frac{1}{25}\right)^{35}$

36. $\int \tan\left(2\tan^{-1}\left(\sqrt{\frac{\sqrt{1+\sqrt{x}}-1}{\sqrt{1+\sqrt{x}}+1}}\right)\right)dx$ equals

(A) $\frac{4}{3}x^{3/4}+c$ (B) $\frac{4}{5}x^{5/4}+c$

(C) $\frac{2}{3}x^{3/4}+c$ (D) $\frac{2}{3}x^{5/4}+c$

37. Find unit vector which is orthogonal to vector $3\hat{i}+2\hat{j}+6\hat{k}$ and is coplanar with vectors $\hat{i}-\hat{j}+\hat{k}$ and $2\hat{i}+\hat{j}+\hat{k}$?

(A) $\frac{2\hat{i}-6\hat{j}+\hat{k}}{\sqrt{41}}$ (B) $\frac{2\hat{i}-3\hat{j}}{\sqrt{13}}$

(C) $\frac{3\hat{j}-\hat{k}}{\sqrt{10}}$ (D) $\frac{4\hat{i}+3\hat{i}-3\hat{k}}{\sqrt{34}}$

38. The curve, which satisfies the differential equation $\frac{xdy-ydx}{xdy+ydx}=y^2\sin(xy)$ and passes through (0, 1), is given by

(A) y (1 - cos xy) + x = 0 (B) sinxy - x = 0

(C) siny + y = 0 (D) cosxy - 2y = 0

SECTION – A
(One or More than one correct type)

*This section contains **THREE (03)** questions. Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four option(s) is (are) correct answer(s).*

39. If $4(\sin x+2\cos y)+3(\cos x+2\sin y)=15$ then

(A) $x=m\pi+(-1)^n\frac{\pi}{2}-\alpha$, where $\alpha=\tan^{-1}\left(\frac{3}{4}\right)$, $m\in I$

(B) $y=k\pi+(-1)^k\frac{\pi}{2}-\beta$, where $\beta=\tan^{-1}\left(\frac{4}{3}\right)$, $k\in I$

(C) $x=2m\pi+\alpha$, where $\alpha=\tan^{-1}\frac{4}{3}$, $m\in I$

(D) $y=2k\pi+\beta$, where $\beta=\tan^{-1}\left(\frac{3}{4}\right)$, $k\in I$.

40. The value of $\sum_{r=0}^{n}(-2)^r \frac{{}^nC_r}{{}^{r+2}C_r}$ can be equal to

(A) $\frac{1}{n}$ (B) $\frac{1}{n+1}$

(C) $\frac{1}{n+2}$ (D) $\frac{1}{n+3}$

41. Consider $f:(-\infty, 0)\cup\left(\frac{1}{3e}, \infty\right)\to R$, defined by $f(x)=\frac{3x}{2}\ell n\left(e-\frac{1}{3x}\right)$ then

(A) f(x) has no point of inflection. (B) f(x) is surjective but not injective

(C) f(x) is bijective function (D) $f(x)=\frac{-1}{2e}$ has two distinct solutions.

[Note : e denotes Napier's constant]

SECTION – B

(Numerical Answer Type)

*This section contains **SIX (06)** Numerical based questions. The answer to each question is a **NON-NEGATIVE INTEGER VALUE**.*

42. If $|a^2-2|=|4a+i|$, where $a\in c$, and $i=\sqrt{-1}$. If maximum value of $|a|^2$ is $p+q\sqrt{r}$ Where p, q, $r\in N$ (p, q, r in least form) then (q+ r – p) is

43. If $\lim_{x\to 0}\int_0^x \frac{t^2dt}{(x-\sin x)\sqrt{a+t}}=1$, then the value of a is

44. Find the number of ordered triplets (α, β, γ) satisfying the inequality $2^{\frac{1}{\sin^2\alpha}}3^{\frac{1}{\sin^2\beta}}4^{\frac{1}{\sin^2\gamma}}\le 24$ where $\alpha, \beta, \gamma\in(0, 2\pi)$

45. Let $I_1=\int_0^x \frac{t^2dt}{(x-\sin x)\sqrt{\lambda^2+2\lambda t}}$ (where λ is non-zero constant) and $I_2=\int_0^{x^2}\frac{e^t-1-t}{x^6}dt$.
If $\lim_{x\to 0} I_1=1$, then the sum of squares of value(s) of λ is equal to :

46. If a_i, i = 1, 2, 3, 4 be four real numbers of the same sign, then the minimum value of $\sum\frac{a_i}{a_j}$, i, $j\in$ {1, 2, 3, 4}, $i\ne j$, is

47. The value of r for which ${}^{30}C_r.{}^{20}C_0+{}^{30}C_{r-1}.{}^{20}C_1+...+{}^{30}C_0.{}^{20}C_r$ is maximum, is :

SECTION – C
(Numerical Answer Type)

*This section contains **TWO (02) paragraphs.** Based on each paragraph, there are **TWO (02)** questions of numerical answer type. The answer to each question is a **NUMERICAL VALUE (XXXXX.XX).** If the numerical value has more than two decimal places, truncate/round-off the value to **TWO** decimal places.*

Paragraph for Question Nos. 48 and 49

Let z_1 and z_2 be complex numbers such that $z_1^2 - 4z_2 = 16 + 20i$ and the roots α and β of $x^2 + z_1x + z_2 + m = 0$ for some complex number m satisfies $|\alpha - \beta| = 2\sqrt{7}$.

48. The maximum value of |m| is p + $\sqrt{q}$ then p + q is

49. The minimum value of |m| is p – $\sqrt{q}$ then p + q is

Paragraph for Question Nos. 50 and 51

A purse contains five coins whose probabilities of showing head when tossed are $\frac{2}{7},\frac{3}{7},\frac{4}{7},\frac{5}{7},\frac{6}{7}$. One coin is picked up randomly and tossed n times, it shows heads n_H times and tails n_T times.

$\lim_{n\to\infty} \frac{n_H}{n_T} = L$

50. Number of values L can take, is/are

51. If L = 2.5 and another coin is picked up randomly from the purse and tossed, then the portability of it showing heads is $\frac{p}{q}$ then q – p equal to