FIITJEE RET – 7

EXTENDED_2019

IIT-2017 (P2)

DATE: 10.09.2018

Time: 3 hours **Maximum Marks: 183**

INSTRUCTIONS:

A. General

1. This booklet is your Question Paper containing 54 questions.
2. Blank papers, clipboards, log tables, slide rules, calculators, cellular phones, pagers and electronic gadgets in any form are not allowed to be carried inside the examination hall.
3. Fill in the boxes provided for Name and Enrolment No.
4. The answer sheet, a machine-readable Objective Response (ORS), is provided separately.
5. DO NOT TAMPER WITH / MULTILATE THE ORS OR THE BOOKLET.

B. Filling in the OMR:

6. The instructions for the OMR sheet are given on the OMR itself.

C. Question paper format & Marking Scheme

7. Each part has three sections as detailed in the following table:

Section	Question Type	Number of Questions	Category wise Marks Each Question				Maximum marks of the section
			Full Marks	Partial Marks	Zero Marks	Negative Marks	
1	**Single Correct Option**	7	**+3** If only the bubble corresponding to the correct option is darkened	——	**0** If none of the bubbles is darkened	**–1** In all other cases	**21**
2	**One or more correct option(s)**	7	**+4** If only the bubble(s) corresponding to all the correct option(s) is (are) darkened.	**+1** For darkening a bubble corresponding to each correct option, provided **NO** incorrect option is darkened.	**0** If none of the bubbles is darkened.	**–2** In all other case.	**28**
3	**Comprehension**	4	**+3** If only the bubble corresponding to the correct option is darkened	——	**0** In all other case.	——	**12**

Don't write / mark your answers in this question booklet.
If you mark the answers in question booklet, you will not be allowed to continue the exam.

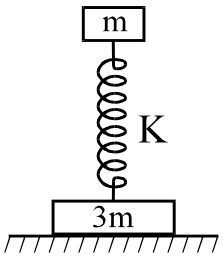
NAME: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

ENROLLMENT NO.: ☐☐☐☐☐☐☐☐☐☐☐☐

PAPER–II
PART I: PHYSICS
SECTION 1 (Maximum Marks: 28)

* This section contains **SEVEN** questions.
* Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is correct.
* For each question, darken the bubble corresponding to all the correct option in the ORS.

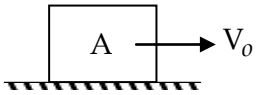
1. In the figure shown the spring constant is K. The mass of the upper disc is m and that of the lower disc is 3m. The upper block is depressed down from its equilibrium position by a distance d =5mg/K and released at t = 0. Find the velocity of 'm' when normal reaction on 3m is mg.



(A) zero (B) $g[m/K]^{1/2}$

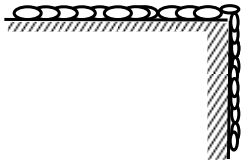
(C) $2g[m/K]^{1/2}$ (D) $4g[m/K]^{1/2}$

2. As shown in the figure block A has a velocity v_0 (initially) at an instant. Coefficient between block and surface is proportional to square of the velocity. If μ_0 is proportionally constant after what distance velocity of block becomes half of its initial velocity?



(A) $\frac{\ln 4}{\mu_0 g}$ (B) $\frac{\ln 2}{\mu_0 g}$ (C) $\frac{2\ln 2}{\mu_0 g}$ (D) $\frac{2\ln 4}{\mu_0 g}$

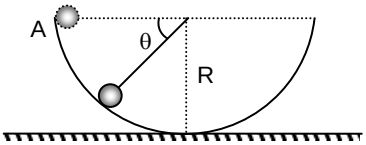
3. A uniform chain of length ℓ is released from rest on a rough horizontal table with a portion h of the chain overhanging as shown in the figure which is just sufficient to initiate the motion. Coefficient of kinetic and static friction between the chain and the horizontal surface is μ. Determine the velocity v of the chain when the last link of the chain leaves the edge. (Height of the table is sufficiently high)

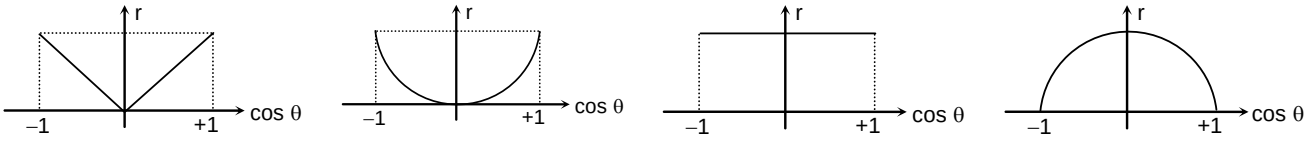


(A) $v = \sqrt{\frac{g\ell}{\mu+1}}$ (B) $v = \frac{\sqrt{2g\ell}}{\mu+1}$ (C) $v = \frac{\sqrt{g\ell}}{\mu+1}$ (D) $v = \sqrt{\frac{2g\ell}{\mu+1}}$

Space for rough work

4. A small particle of mass m is released from rest from point A inside a frictionless fixed hemispherical bowl as shown. The graph between the ratio(r) of magnitude of centripetal force and normal reaction on the particle at any point on the bowl as a function of cos θ is



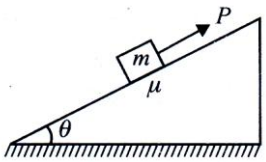


(A) (B) (C) (D)

5. A block of mass m is being pulled up the rough incline by an agent delivering constant power P. The coefficient of friction between the block and the incline is μ. The maximum speed of the block during the course of ascent is

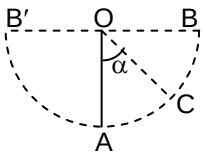
a. $v = \dfrac{P}{mg\sin\theta + \mu\, mg\cos\theta}$ **c.** $v = \dfrac{2P}{mg\sin\theta - \mu\, mg\cos\theta}$

b. $v = \dfrac{P}{mg\sin\theta - \mu\, mg\cos\theta}$ **d.** $v = \dfrac{3P}{mg\sin\theta - \mu\, mg\cos\theta}$



PARAGRAPH (6–7)

A simple pendulum is vibrating with an angular amplitude of 90° as shown in the following figure.



6. For what value of α, is the acceleration directed vertically upwards

(A) 0^o (B) $\cos^{-1}\left(\dfrac{1}{\sqrt{3}}\right)$ (C) 90^o (D) 45^o

7. For what value of α, is the acceleration directed horizontally

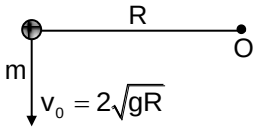
(A) $\cos^{-1}\left(\dfrac{1}{\sqrt{3}}\right)$ (B) 0^o (C) 90^o (D) 45^o

Space for rough work

SECTION 2 (Maximum Marks: 15)

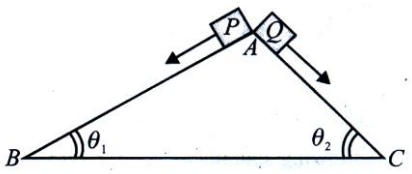
- This section contains **SEVEN** questions.
- Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four options is(are) correct.
- For each question, darken the bubble(s) corresponding to all the correct option(s) in the ORS.
- For example, if (A), (C) and (D) are all the correct options for a question, darkening all these three will get +4 marks; darkening only (A) and (D) will get +2 marks; and darkening (A) and (B) will get –2 marks, as a wrong option is also darkened.

8. A particle of mass m is connected to a fixed point O by means of an inextensible string and is free to move in a vertical plane. The particle is initially given a velocity $v_0 = 2\sqrt{gR}$ when the string is in horizontal position. Then



(A) the minimum tension in the string during subsequent motion is mg
(B) the initial acceleration of the particle will be 4g
(C) the minimum initial velocity to be imparted to particle in the position shown for it to complete the vertical circle will be $\sqrt{3gR}$
(D) the tangential acceleration of the particle when the velocity vector becomes horizontal is zero

9. Two inclined frictionless tracks of different inclinations meet at A from where two blocks F and Q of different masses are allowed to slide down from rest at the same time, one on each track, as shown in the figure. Then



(A) both blocks will reach the bottom at the same time
(B) block Q will reach the bottom earlier than block B
(C) both blocks will reach the bottom with the same speed
(D) block Q will reach the bottom with a higher speed than block P

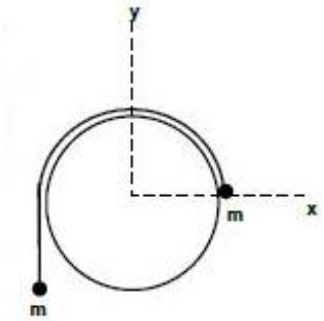
10. A particle of mass m describe circular path of radius `r' and its radial or normal or centripetal acceleration depends on time `t' as $a_R = Kt^2$. K is +ve constant, then :

(A) at any time `t' force acting on particle is $m\sqrt{kr + k^2t^4}$
(B) Power developed at any time t is mkrt
(C) Power developed at any time t is $mk^{3/2}/r^{3/2}t$
(D) Tangential acceleration is also varying.

Space for rough work

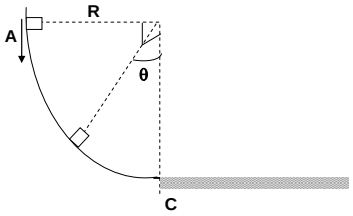
11. A particle of mass 'm' is suspended with a string of length 'ℓ'. When it is at he bottom most point, a particle is given a horizontal velocity of $\sqrt{4g\ell}$. Identify the correct statements ?
(A) Particle will not be able to complete a vertical circular motion.
(B) When tension in the string becomes zero, particle has a velocity of $\sqrt{g\ell}$.
(C) Maximum height reached by the particle above the initial position is $\frac{50\ell}{27}$
(D) At the height point, particle has zero velocity

12. Figure shows a fixed smooth cylinder of radius R with centre at origin of co–ordinates. An ideal thread is thrown over it, On two ends of the thread two identical masses are tied which are initially at rest at co–ordinates (R, 0) and (–R, –R) respectively. If mass at x–axis is given a slight upward jerk, it leaves contact with the cylinder at (R cos ϕ, R sin ϕ). Then find $\frac{\phi}{\sin\phi}$.



(A) 2 (B) 1/2
(C) 2/3 (D) none

13. A particle of mass m is placed on vertical fixed circular track and then it is given velocity v vertically downward at position A on track. If block moves on track with constant speed them



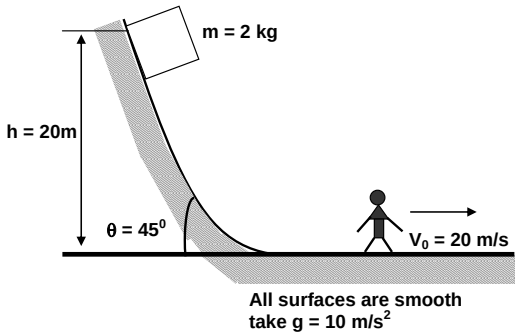
(A) Coefficient of friction between block and circular track as function of angle θ is $\mu = \frac{\sin\theta}{\cot\theta + \frac{v^2}{Rg}}$

(B) Coefficient of friction between block and circular track as function of angular θ is $\mu = \frac{\sin\theta}{\cos\theta + \frac{v^2}{Rg}}$

(C) Instantaneous power due to friction is (–mg sinθ v)
(D) Work done from A to C by friction on block will be (–mgR)

Space for rough work

14. A block of mass m is released from top of an inclined plane of inclination $\theta = 45°$ as shown in the figure. An observer is moving on the horizontal floor with constant velocity 20 m/s as shown. When the block reaches the horizontal floor



(A) Velocity observed by observer will be 20 m/s
(B) Change in kinetic energy of the block will be –400 J as observed by observer
(C) Work energy theorem is not applicable in moving observer frame
(D) Work done by normal reaction is – 800 J as observed by the observer.

SECTION 3 (Maximum Marks: 18)

∗ This section contains **TWO** paragraphs.
∗ Based on each paragraph, there are **TWO** questions.
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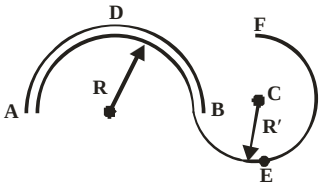
Paragraph–1

In the figure shown ADB and BEF are two fixed smooth circular paths of radius R and R′ respectively. A ball of mass m enters in the tube ADB through point A with minimum velocity to reach point B. From there it moves on other circular path BEF and it is just able to complete the circle.



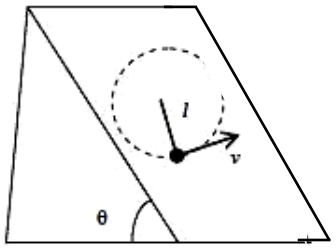
15. The minimum velocity at A is given to the ball is
(A) $\sqrt{4Rg}$ (B) $\sqrt{2Rg}$ (C) $\sqrt{3Rg}$ (D) $\sqrt{5Rg}$

16. The ratio of radius of two circular paths ADB and BEF is
(A) $\frac{R}{R'}=\frac{2}{3}$ (B) $\frac{R}{R'}=\frac{3}{2}$ (C) $\frac{R}{R'}=\frac{2}{5}$ (D) $\frac{R}{R'}=\frac{5}{2}$

Space for rough work

Paragraph–2

A pendulum bob swings along a circular path on a smooth inclined plane as shown in figure. Where m = 3 kg, ℓ = 0.3 , θ = 37°. Take g = 10 ms^{-2}. The bob is just able to complete full circular motion. Then,



17. The speed of the bob at the lowest point?
(A) 2 m/s (B) $3\sqrt{3}$ m/s (C) 3 m/s (D) none

18. The tension in the string when it is horizontal?
(A) 60 N (B) 54 N (C) 24 N (D) none

PART II: CHEMISTRY

SECTION 1 (Maximum Marks: 28)

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19. In a compound, oxide ions constitute cubic close packing. Cations A occupy 50% of tetrahedral holes while cations B occupy all the octahedral voids. The empirical formula of the compound is
(A) AB_2O_4 (B) ABO_2 (C) A_2BO_4 (D) ABO

20. In Na_2O structure:
(A) O^{2-} constitute ccp and Na^+ ions occupy all the octahedral holes
(B) O^{2-} ions constitute ccp and Na^+ ions occupy all the tetrahedral holes
(C) O^{2-} ions constitute ccp and Na^+ ions occupy 50% of tetrahedral holes and 100% octahedral holes.
(D) Na^+ ions constitute ccp and O^{2-} ions occupy half of octahedral holes.

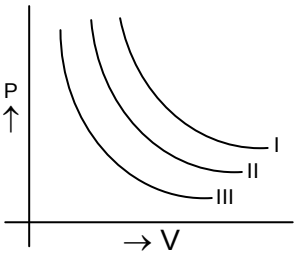
21. Of the two flasks, A and B which are of equal volumes, A contains H_2 at 27°C but B contains equal mass of C_2H_6 at 627°C. Assuming ideal behavior of gases, which of the following statements is correct?
(A) H_2 molecules in a A will move 4.8 times faster than C_2H_6 molecules in B
(B) C_2H_6 molecules in B will move 2.24 times faster than H_2 molecules in A.
(C) Both the molecules will move in the same speed, since the containers are of equal volumes.
(D) H_2 molecules in 'A' will move 2.24 time faster than C_2H_6 molecules in 'B'

Space for rough work

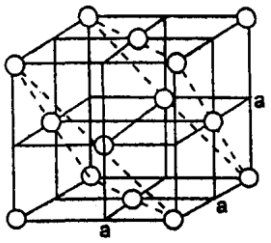
22. When 2g of gaseous substance A is introduced into an initially evacuated flask at 25°C the pressure is found to be 1.0 atm. The flask is evacuated and 3g of B is introduced, the pressure is found to be 0.5 atm at same temperature. The ratio of M_A/M_B (molecular mass ratio of A to B) is
(A) 3 : 1 (B) 1 : 3 (C) 2 : 3 (D) 2 : 5

23. A vessel has He gas and water vapours at a total pressure of 1 atm. The partial pressure of water vapours is 0.3 atm. The contents of this vessel are transferred to another vessel having one third of the capacity of original volume, completely at the same temperature, the total pressure of the system in the new vessel is:
(A) 3.0 atm (B) 1 atm (C) 3.33 atm (D) 2.4 atm

24. I, II, III are three isotherm respectively at T_1, T_2 & T_3 temperatures will be in order
(A) $T_1 = T_2 = T_3$
(B) $T_1 < T_2 < T_3$
(C) $T_1 > T_2 > T_3$
(D) $T_1 > T_2 = T_3$



25. Metallic gold crystallizes in the face-centered cubic lattice. The length of the cubic unit cell (a = 4.212 Å). What is the closest distance between gold atoms?
(A) A° (B) 3A°
(C) 5A° (D) 8 A°



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26. Indicate the correct statement for equal volumes of $N_2(g)$ and $CO_2(g)$ at 25°C C and 1 atm
(A) The average translational K.E. per molecule is the same for N_2 and CO_2
(B) The rms speed remains constant for both N_2 and CO_2
(C) The density of N_2 is less than that of CO_2
(D) The total translational K.E. of both N_2 and CO_2 is the same

Space for rough work

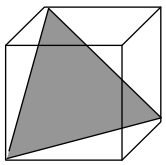
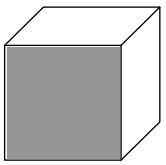
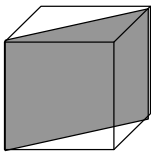
7. According to Charles' law

(A) $V \propto \frac{1}{T}$ (B) $\left(\frac{dV}{dT}\right)_P = K$ (C) $\left(\frac{dT}{dV}\right)_P = K$ (D) $\left(\frac{1}{T} - \frac{V}{T^2}\right)_P = 0$

28. Which of the following is/are correct with respect to zinc blende structure?
(A) Zn^{2+} ions are preset at the corners and at the centres of each face
(B) Only alternate tetrahedral holes are occupied by Zn^{2+} ions
(C) The coordination number of Zn^{2+} and S^{2-} is 4 each
(D) The number of ZnS units in a unit cell is 4

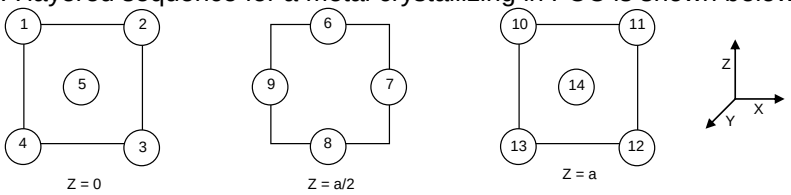
29. An hcp and a ccp structure for a given element would be expected to have
(A) The same coordination number (B) the same density
(C) the same packing fraction (D) the same effective number of atoms

30. Following three planes (P_1, P_2, P_3) in an FCC unit cell of an element are shown:

(P_1)  (P_2)  (P_3) 

Choose the correct options:
(A) P_1 contains no voids of three dimensions Δ
(B) P_2 contains only Octahedral voids
(C) P_3 contains both Octahedral and Tetrahedral voids
(D) Area of plane P_1 is minimum.

31. A layered sequence for a metal crystallizing in FCC is shown below:



A face diagonal passes through the centre of atom 4 and the centre(s) of which other atom(s)?
(A) 9, 7 (B) 2, 5 (C) 8, 12 (D) 9, 10

32. The vander Waal's constants of a gas are
$a = 0.751\ dm^6\ atm\ mol^{-2}$
$b = 0.0226\ dm^3\ mol^{-1}$
Hence,
(A) $V_c = 0.678\ dm^3\ mol^{-1}$ (B) $V_c = 0.0678\ dm^3\ mol^{-1}$
(C) $P_c = 54.5$ atm (D) $T_c = 120$ K

Space for rough work

SECTION 3 (Maximum Marks: 18)

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Paragraph–1

The equation of state PV = nRT is derived from the postulates of kinetic gas theory. Gases which obey the above equation is called as ideal gas equation. Many gases deviate from ideal gas behaviour. So it became necessary to modify the kinetic theory of gases. The following two postulate do not appear to hold good under all conditions.

Postulate 1: the volume occupied by the molecules themselves is negligibly small as compared to the total volume occupied by the gas.

Postulate 2: the forces of attraction between gas molecules are negligible.

Suitable corrections were applied to the ideal gas equation so as to make it applicable to real gases.

Van der waals brought this modification to the ideal gas equation by suggesting that the gas molecules were not mass points but behave like rigid spheres having certain diameter and that there exists certain intermolecular forces of attraction between them. After applying those corrections, the modified equation is
$(P + n^2a/v^2)\ (V_m - nb) = nRT$.

The above equation is called van der waals equation. The terms "a" and "b" in the equation is known as van der waals constants. The constant "a" gives the measure of the van der waals forces of cohesion existing between the molecules of a given gas.
The vanderWaal's constants a and b for three gases x, y and z are given below :

Gas	a ($kPadm^6\ mol^{-2}$)	b($dm^3\ mol^{-1}$)
X	658	0.056
Y	553	0.030
Z	888	0.084

33. The correct order of ease of liquification of these gases is :
(A) Z > X > Y (B) Y > X > Z (C) X > Y > Z (D) Z > Y > X

34. 10 moles each of gases X, Y and Z are taken in three different containers of 5 litre volume. Which gas has the maximum compressible volume.
(A) X (B) Y
(C) Z (D) All the gases have same compressible volume.

Space for rough work

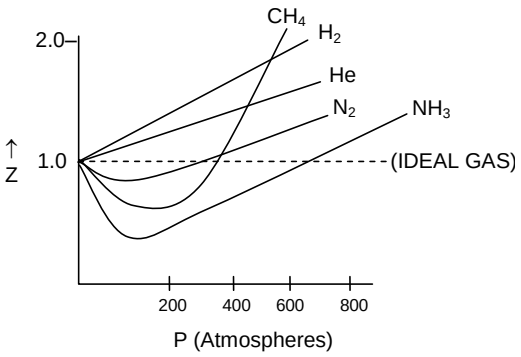
Paragraph–2

The deviations from ideal behaviour of gases are best represented in terms of the compressibility factor , z, which is defined as,

$$Z = \frac{V_m}{V_m(\text{ideal})}$$

For an ideal gas, Z = 1 under all conditions of temperature and pressure. The deviation of z from unity is a measure of the imperfection of the gas under consideration.

The following figure represents the graphs plotted for the compressibility factors determined for a number of gases over a range of pressure at constant temperature $\left(0^0\text{C}\right)$.



35. Which of the following statements are correct ?
(i) For H_2 and He, repulsive forces are always dominant at all temperature and pressure.
(ii) At 0°C, the liquification of H_2 & He are difficult as compared to N_2 and CH_4.
(iii) At a pressure of 150 atmosphere, the order of compressibility of gases is $NH_3 > CH_4 > N_2 > H_2 > He$
(iv) At 0°C, lowest pressure is required for the liquification on of NH_3.
(A) i & iv (B) i, ii and iv (C) ii & iv (D) ii, iii and iv

36. In the PV_m vs. P plot for H_2 gas at 0°C,
(A) A straight line is obtained which is parallel to the P–axis.
(B) A straight line having slope b and intercept RT on PV_m axis is obtained.
(C) A curve like the Z–P plot of NH_3 in the given figure (comprehension) is obtained.
(D) A straight line passing through origin with slope b is obtained.

Space for rough work

PART III: MATHEMATICS

SECTION 1 (Maximum Marks: 28)

∗ This section contains **SEVEN** questions.
∗ Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is correct.
∗ For each question, darken the bubble corresponding to all the correct option in the ORS.

37. The equation of the tangent to the curve $y = e^{-|x|}$ at the point where the curve cuts the line x = 1 is
(A) x + y = e (B) e(x + y) = 1 (C) y + ex = 1 (D) none of these

38. Total number of critical points of f(x) = max. {sin x, cos x} $\forall$ x $\in$ $(-2\pi, 2\pi)$ is equal to
(A) 5 (B) 7 (C) 4 (D) 3

39. The global maxima of $f(x) = [2\{-x^2 + x + 1\}]$ is
(where {x} denotes fractional part of x, and [.] denotes greatest integer function):
(A) 2 (B) 1 (C) 0 (D) none of these

40. The fuel charges for running a train are proportional to the square of the speed generated in mile/h and costs Rs.48 per h at 16 miles/h. The most economical speed if the fixed charges i.e., salaries, etc. Amount to Rs.300 per h.
(A) 10 miles/h (B) 20 miles/h (C) 30 miles/h (D) 40 miles/h

41. $\int\left(\frac{x^4\left(x^{2x}+1\right)(\ln x+1)}{x^{4x}+1}\right)dx =$

(A) $\frac{1}{\sqrt{2}}\tan^{-1}\left(\frac{x^x-\frac{1}{x^x}}{2}\right)+C$ (B) $\frac{1}{2}\tan^{-1}\left(\frac{x^x-\frac{1}{x^x}}{2}\right)+C$

(C) $\frac{1}{\sqrt{2}}\tan^{-1}\left(\frac{x^x-\frac{1}{x^x}}{\sqrt{2}}\right)+C$ (D) $\frac{1}{2}\tan^{-1}\left(\frac{x^x-\frac{1}{x^x}}{\sqrt{2}}\right)+C$

42. The co-ordinates of the point on the parabola $y^2 = 8x$, which is at minimum distance from the circle $x^2 + (y + 6)^2 = 1$ are
(A) (2, 4) (B) (–2, 4) (C) (2, –4) (D) none of these

43. P_1 and P_2 are the foot of altitudes drawn from the foci S_1 and S_2 respectively of the ellipse $\frac{x^2}{16}+\frac{y^2}{9}=1$ on one of it's variable tangent. Maximum value of $(S_1P_1)(S_2P_2)$ is equal to
(A) 9 (B) 16 (C) 25 (D) 7

Space for rough work

SECTION 2 (Maximum Marks: 15)

- This section contains **SEVEN** questions.
- Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four options is(are) correct.
- For each question, darken the bubble(s) corresponding to all the correct option(s) in the ORS.
- For example, if (A), (C) and (D) are all the correct options for a question, darkening all these three will get +4 marks; darkening only (A) and (D) will get +2 marks; and darkening (A) and (B) will get –2 marks, as a wrong option is also darkened.

44. Equation of tangent to the ellipse $\frac{x^2}{9}+\frac{y^2}{4}=1$ which cut off equal intercepts on the axes is

(A) $y = x + \sqrt{(13)}$ (B) $y = -x + \sqrt{(13)}$ (C) $y = x - \sqrt{(13)}$ (D) $y = -x - \sqrt{(13)}$

45. If $\int \frac{\sin x}{\sin\left(x-\frac{\pi}{4}\right)}dx = A\{f(x) + \log|\sin x - \cos x|\} + C$, then

(A) $A = \sqrt{2}$ (B) $A = \frac{1}{\sqrt{2}}$ (C) $f(x) = \sin x$ (D) $f(x) = x$

46. If $f(x) = x^3 - x^2 + 100x + 2002$, then

(A) $f(1000) > f(1001)$ (B) $f\left(\frac{1}{2000}\right) > f\left(\frac{1}{2001}\right)$

(C) $f(x-1) > f(x-2)$ (D) $f(2x-3) > f(2x)$

47. The values of parameter 'a' for which the point of minimum of the function $f(x) = 1 + a^2x - x^3$ satisfies the inequality $\frac{x^2+x+2}{x^2+5x+6} < 0$ are

(A) $\left(2\sqrt{3},3\sqrt{3}\right)$ (B) $\left(-3\sqrt{3},-2\sqrt{3}\right)$ (C) $\left(-2\sqrt{3},3\sqrt{3}\right)$ (D) $\left(-3\sqrt{2},2\sqrt{3}\right)$

Space for rough work

48. Let the parabolas $y = x(c - x)$ and $y = x^2 + ax + b$ touch each other at the point (1, 0) then
(A) $a + b + c = 0$ (B) $a + b = 2$ (C) $b - c = 1$ (D) $a + c = -2$

49. Let $h(x) = f(x) - \{f(x)\}^2 + \{f(x)\}^3$, for all real values of x, then
(A) h(x) is increasing whenever f(x) is increasing
(B) h(x) is increasing whenever f(x) is decreasing
(C) h(x) is decreasing whenever f(x) is decreasing
(D) nothing can be said in general

50. Let PQ be a chord of the parabola $y^2 = 4x$. A circle drawn with PQ as a diameter passes through the vertex V of the parabola. If Ar (ΔPVQ) = 20 unit^2, then the coordinates of 'P' are
(A) (16, 8) (B) (16, –8) (C) (–16, 8) (D) (–16, –8)

SECTION 3 (Maximum Marks: 18)

- This section contains **TWO** paragraphs.
- Based on each paragraph, there are **TWO** questions.
- Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is correct.
- For each question, darken the bubble corresponding to the correct option in the ORS.

Paragraph–1

If ℓ, m are variable real number such that $5\ell^2 + 6m^2 - 4\ell m + 3\ell = 0$, then variable line $\ell x + my = 1$ always touches a fixed parabola, whose axes is parallel to x-axis

51. Vertex of the parabola is
(A) $\left(-\frac{5}{3},\frac{4}{3}\right)$ (B) $\left(-\frac{7}{4},\frac{3}{4}\right)$ (C) $\left(\frac{5}{6},-\frac{7}{6}\right)$ (D) $\left(\frac{1}{2},-\frac{3}{4}\right)$

52. Directrix of the parabola is
(A) $6x + 7 = 0$ (B) $4x + 11 = 0$ (C) $3x + 11 = 0$ (D) none of these

Space for rough work

Paragraph–2

Consider the curve $x = 1 - 3t^2$, $y = t - 3t^3$. If a tangent at point $(1 - 3t^2, t - 3t^3)$ inclined at an angle θ to positive x-axis and another tangent at point P(–2, 2) cuts the curve again at Q.

53. The point Q will be

(A) (1, –2) (B) $\left(-\frac{1}{3},-\frac{2}{3}\right)$ (C) (–2, 1) (D) none of these

54. The angle between the tangent at P and Q is

(A) $\frac{\pi}{4}$ (B) $\frac{\pi}{6}$ (C) $\frac{\pi}{2}$ (D) $\frac{\pi}{3}$

Space for rough work

FIITJEE RET – 6

EXTENDED_2019

IIT-2017 (P2)

DATE: 10.09.2018

ANSWERS

PHYSICS

1.	**D**	2.	**B**	3.	**A**	4.	**C**
5.	**A**	6.	**A**	7.	**A**	8.	**ACD**
9.	**BC**	10.	**AB**	11.	**AC**	12.	**A**
13.	**BCD**	14.	**BD**	15.	**B**	16.	**B**
17.	**C**	18.	**B**				

CHEMISTRY

19.	**D**	20.	**B**	21.	**D**	22.	**B**
23.	**D**	24.	**C**	25.	**B**	26.	**ACD**
27.	**BC**	28.	**BCD**	29.	**AC**	30.	**ABCD**
31.	**BCD**	32.	**BCD**	33.	**B**	34.	**B**
35.	**B**	36.	**B**				

MATHEMATICS

37.	**D**	38.	**B**	39.	**A**	40.	**D**
41.	**C (Bonus)**	42.	**C**	43.	**A**	44.	**BD**
45.	**BD**	46.	**BC**	47.	**AB**	48.	**ACD**
49.	**AC**	50.	**AB**	51.	**A**	52.	**C**
53.	**D**	54.	**C**				