FIITJEE PET – VI (REG_1ST YEAR)

MAINS_SET–A

DATE: 28.07.2018

Time: 3 hours **Maximum Marks: 360**

INSTRUCTIONS:

Instructions to the Candidates

1. This Test Booklet consists of **90 questions**.

   Use **Blue/Black ball Point Pen only** for writing particulars and bubbling of OMR.

2. For each correct answer **4 Marks** will awarded and for each wrong answer **1 Mark** will be deducted.

3. Attempt all questions.

4. In case you have not darkened any bubble you will be awarded 0 mark for that question.

5. Use of calculator/logarithmic table is not permitted.

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.: ☐☐☐☐☐☐☐☐☐☐☐☐

1. Let PS be the median of the triangle with vertices P(2, 2), Q(6, –1) and R(7, 3). The equation of the line passing through (1, –1) and parallel to PS, is
(A) 2x – 9y – 7 = 0 (B) 2x – 9y – 11 = 0 (C) 2x + 9y – 11 = 0 (D) 2x + 9y + 7 = 0

2. The point P(a, b) lies on the straight line 3x + 2y = 13 and the point Q(b, a) lies on the straight line 4x – y = 5, then the equation of the line PQ is
(A) x – y = 5 (B) x + y = 5 (C) x + y = –5 (D) x – y = –5

3. The locus of the mid-point of the portion intercepted between the axes by the x cos α + y sin α = p, where p is a constant is
(A) $x^2 + y^2 = 4p^2$ (B) $\frac{1}{x^2}+\frac{1}{y^2}=\frac{1}{p^2}$ (C) $x^2 + y^2 = \frac{4}{p^2}$ (D) $\frac{1}{x^2}+\frac{1}{y^2}=\frac{2}{p^2}$

4. If A(1, 1), $B\left(\sqrt{3}+1,2\right)$ and $C\left(\sqrt{3},\sqrt{3}+2\right)$ be three vertices of a square, then the diagonal through B is
(A) $y = \left(\sqrt{3}-2\right)x+\left(3-\sqrt{3}\right)$ (B) y = 0
(C) y = x (D) none of these

5. The equation of a straight line passing through the point of intersection of x – y + 1 = 0 and 3x + y – 5 = 0 and perpendicular to one of them, is
(A) x + y + 3 = 0 (B) x – y – 3 = 0 (C) x – 3y – 5 = 0 (D) x – 3y + 5 = 0

6. The equation of the line with slope $-\frac{3}{2}$ which is concurrent with the line 4x + 3y – 7 = 0 and 8x + 5y – 1 = 0 is
(A) 3x + 2y – 2 = 0 (B) 3x + 2y – 63 = 0 (C) 2y – 3x – 2 = 0 (D) none of these

7. The equation of lines parallel to x + 7y + 2 = 0 and at a unit distance from the point (7, –1) are
(A) $x+7y\pm5\sqrt{2}=0$ (B) $x+7y\pm5=0$ (C) $x+7y\pm6\sqrt{2}=0$ (D) $x+7y\pm6=0$

8. Two points (a, 0) and (0, b) are joined by a straight line. Another point on this line, is
(A) (3a, –2b) (B) (a^2, ab) (C) (–3a, 2b) (D) (a, b)

9. If the line segment joining (2, 3) and (–1, 2) is divided internally in the ratio 3 : 4 by the line x + 2y = λ, then λ =
(A) $\frac{41}{7}$ (B) $\frac{5}{7}$ (C) $\frac{36}{7}$ (D) $\frac{31}{7}$

Space for rough work

10. A line is such that its segment between the straight lines 5x – y – 4 = 0 and 3x + 4y – 4 = 0 is bisected at the point (1, 5), then its equation is
(A) 83x – 35y + 92 = 0 (B) 35x – 83y + 92 = 0 (C) 35x + 35y + 92 = 0 (D) None of these

11. The ends of the base of an isosceles triangle are at (2a, 0) and (0, a). The equation of one side is x = 2a. The equation of the other side is
(A) x + 2y – a = 0 (B) x + 2y = 2a (C) 3x + 4y – 4a = 0 (D) 3x – 4y + 4a = 0

12. y = mx + 5 be a line then the range of m so that points (5, 6) and (–6, 6) always lies on the same side of the origin is
(A) $m > \frac{1}{5} \text{ or } m < \frac{-1}{4}$ (B) $m > \frac{1}{4} \text{ or } m < \frac{-1}{5}$ (C) $-\frac{1}{4} < m < \frac{1}{5}$ (D) $m > \frac{1}{5} \text{ or } m < \frac{-1}{6}$

13. The vertex of an equilateral triangle is (2,–1) and the equation of its base in x + 2y = 1. The length of its sides is
(A) $\frac{4}{\sqrt{15}}$ (B) $\frac{2}{\sqrt{15}}$ (C) $\frac{4}{3\sqrt{3}}$ (D) $\frac{1}{\sqrt{5}}$

14. Two points A and B have coordinates (1, 1) and (3, –2) respectively. The co-ordinates of a point distant $\sqrt{85}$ from B on the line through B perpendicular to AB are
(A) (4, 7) (B) (7, 4) (C) (5, 7) (D) (–5, –3)

15. If (– 2, 6) is the image of the point (4, 2) with respect to line L = 0, then L =
(A) 3x – 2y + 5 (B) 3x – 2y + 10 (C) 2x + 3y – 5 (D) 6x – 4y – 7

16. The line 3x + 2y = 24 meets y-axis at A and x-axis at B. The perpendicular bisector of AB meets the line through (0, –1) parallel to x-axis at C. The area of the triangle ABC is
(A) 182 sq. units (B) 91 sq. units (C) 48 sq. units (D) None of these

17. A line L passes through the points (1, 1) and (2, 0) and another line L′ passes through $\left(\frac{1}{2}, 0\right)$ and perpendicular to L. Then the area of the triangle formed by the lines L, L′ and y- axis, is
(A) 15/8 (B) 25/4 (C) 25/8 (D) 25/16

18. The coordinates of the foot of perpendicular from (a, 0) on the line $y = mx + \frac{a}{m}$ is/are
(A) $\left(0, -\frac{1}{a}\right)$ (B) $\left(0, \frac{a}{m}\right)$ (C) $\left(0, -\frac{a}{m}\right)$ (D) $\left(0, \frac{1}{a}\right)$

Space for rough work

19. Image of the point (4, –3) with respect to the line y = x is
(A) (–4, –3) (B) (3, 4) (C) (–4, 3) (D) (–3, 4)

20. The points A(2a, 4a), B(2a, 6a), C(2a + $\sqrt{3}$ a, 5a), a > 0 are the vertices of
(A) a right angled triangle (B) an equilateral triangle
(C) an isosceles triangle (D) none of these

21. The points (–a, –b), (0, 0), (a, b) and (a^2, ab) are
(A) collinear (B) vertices of a parallelogram
(C) vertices of a rectangle (D) none of these

22. Let the vertices of a triangle be (0, 0), (3, 0) and (0, 4). Its orthocenter is
(A) (0, 0) (B) $\left(1,\frac{4}{3}\right)$ (C) $\left(\frac{3}{2},2\right)$ (D) none of these

23. The area enclosed by |x| + |y| = 1 is
(A) 1 (B) 2 (C) 3 (D) 4

24. The nearest point on the line 3x + 4y = 25 from the origin is
(A) (–4, 5) (B) (3, –4) (C) (3, 4) (D) (3, 5)

25. The point of intersection of the lines $\frac{x}{a}+\frac{y}{b}=1$ and $\frac{x}{b}+\frac{y}{a}=1$ lies on the line
(A) x – y = 0 (B) (x – y)(a + b) = 2ab
(C) (ℓx + my)(a – b) = (ℓ + m)ab (D) (ℓx – my)(a – b) = (1 – m)ab

26. The equations of the lines through (–1, –1) and making angles 45° with the line x + y = 0 are given by
(A) x + 1 = 0, x – y = 0 (B) y + 1 = 0, x – y = 0 (C) x + 1 = 0, y + 1 = 0 (D) none of these

27. A straight line through P(1, 2) is such that its intercept between the axes is bisected at P. Its equation is
(A) x + 2y = 5 (B) x – y + 1 = 0 (C) x + y – 3 = 0 (D) 2x + y – 4 = 0

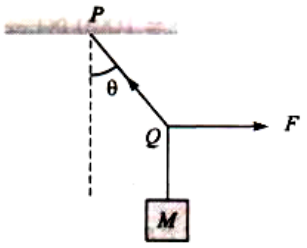
28. The ratio in which the line 3x – 4y + 5 = 0 divides the line segment joining the points (2, –4), (–3, 1) is
(A) 26 : 9 (B) 27 : 8 (C) 24 : 7 (D) 22 : 6

Space for rough work

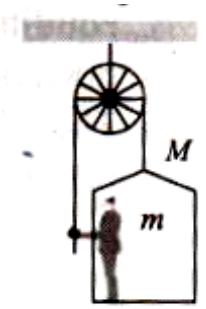
29. A line L cuts the sides AB, BC of ABC in the ratio 2 : 5, 7 : 4 respectively, then the line L cuts CA in the ratio
(A) 7 : 10 (B) 7 : –10 (C) 10 : 7 (D) 10 : –7

30. If the lines joining any point O to vertices A, B, C of a triangle meet the opposite sides in D, E, F respectively, then $\frac{BD}{DC}.\frac{CE}{EA}.\frac{AF}{FB}$ =
(A) 1 (B) 2 (C) –3 (D) 3

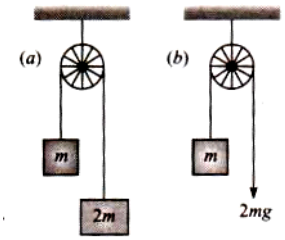
31. A mass M is suspended by a rope from a rigid support at P as shown in fig. Another rope is tied at the end Q, and it is pulled horizontally with a force F. If the rope PQ makes angle θ with the vertical, then the tension in the string PQ is
(A) $F\sin\theta$ (B) $F/\sin\theta$
(C) $F\cos\theta$ (D) $F/\cos\theta$



32. A man of mass m stands on a crate of mass M. He pulls on a light rope passing over a smooth light pulley. The other end of the rope is attached to the crate. For the system to be in equilibrium, the force exerted by the man on the rope will be
(A) $(M+m)g$ (B) $\frac{1}{2}(M+m)g$
(C) Mg (D) mg

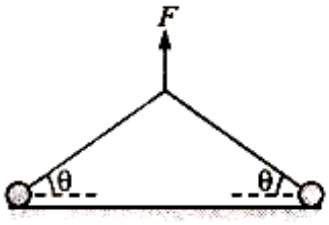


33. The two pulley arrangements shown in fig are identical. The mass of the rope is negligible. In (a) the mass m is lifted up by attaching a mass 2 m to the other end of the rope. In (b) m is lifted up by pulling the other end of the rope with a constant downward force of 2mg. The ratio of accelerations in two cases will be
(A) 1 :1 (B) 1 :2
(C) 1:3 (D) 1:4



Space for rough work

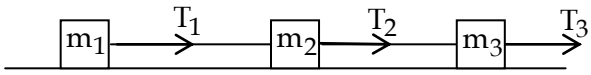
34. Two small spheres each of mass m connected by a string of length 2ℓ are kept on a smooth horizontal surface. A vertical force F is applied at the middle of the string. What is maximum value of F for which the sphere do not lose contact wit the surface ?



(A) 2 mg (B) mg

(C) $\frac{3mg}{2}$ (D) 4 mg

35 Three blocks of masses m_1, m_2 and m_3 are connected by massless strings on a frictionless table. They are pulled with a force $T_3 = 40N$. If $m_1 = 10kg$, $m_2 = 6kg$ and $m_3 = 4kg$, the tension T_2 will be

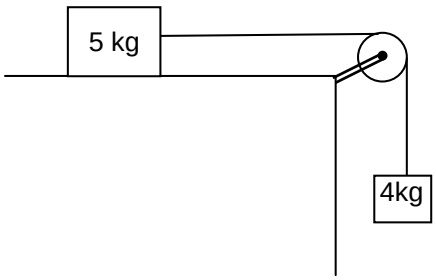


(A) 20 N (B) 40 N (C) 10 N (D) 32N

36. A 500 g ball moving at 15 m/s slows down uniformly until it stops. If the ball travels 15m, what was the average net force applied while it was coming to a stop?

(A) 0.375 N (B) 3.75 N (C) 37.5 N (D) 6.25 N

37. Two masses of 4 kg and 5 kg are connected by a string passing through frictionless pulley as shown. Find the acceleration of 5 kg mass



(A) $\frac{2g}{9}$ (B) $\frac{g}{9}$

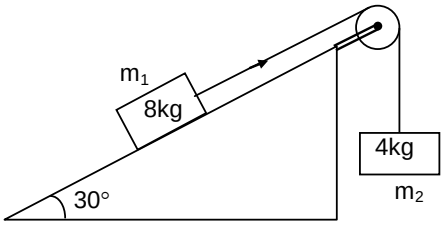
(C) $\frac{4g}{9}$ (D) g

38. Two masses of 2 kg and 3 kg are attached to the end of the string passed over a pulley fixed at the top. The tension and acceleration are(in SI units)

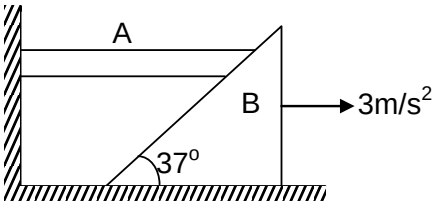
(A) $\frac{7g}{8}, \frac{g}{8}$ (B) $\frac{21g}{8}, \frac{g}{8}$ (C) $\frac{12g}{5}, \frac{g}{5}$ (D) $\frac{12g}{8}, \frac{g}{5}$

Space for rough work

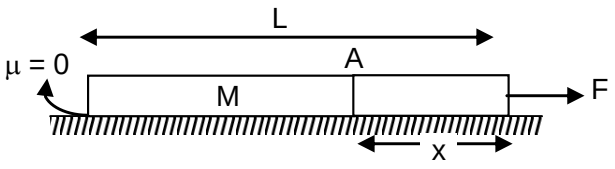
39. Two masses of 8 kg and 4 kg are connected by a string as shown in figure over a frictionless pulley. The acceleration of the system is
(A) 4 m/s^2 (B) 2 m/s^2
(C) zero (D) 9.8 m/s^2



40. In the given figure direction of the acceleration of A
(A) towards right (B) towards left
(C) downward (D) upward

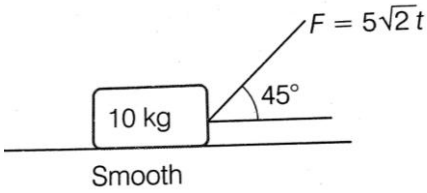


41. Find the tension in rope at section A, at a distance x from the right end $\left(x = \frac{3L}{4}\right)$

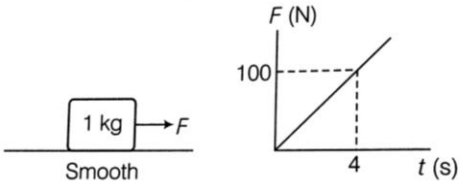


(A) F (B) $\frac{3F}{4}$ (C) $\frac{F}{3}$ (D) $\frac{F}{4}$

42. A force F = $5\sqrt{2}$ t N is applied on the block as shown in the figure. The block starts from rest at t = 0, then
(A) the block leaves the horizontal surface at t = 20 s
(B) the block never leaves the horizontal surface
(C) the velocity of block at t = 20 s is 100 m/s
(D) both a and c are correct

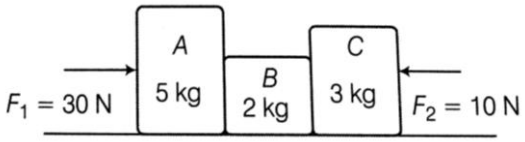


43. The force F which is applied to 1 kg block initially at rest varies linearly with time as shown in the figure. Find velocity of the block at t = 4 s.
(A) 100 m/s (B) 200 m/s
(C) 20 m/s (D) 4 m/s



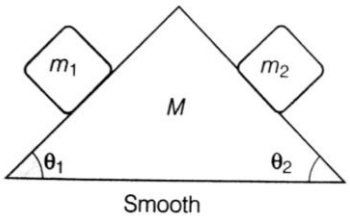
Space for rough work

44. The figure shows three blocks in contact and placed on a smooth horizontal fixed table. The ratio of force exerted by block A to B and the force by block B to C is



(A) 1 : 2 (B) 2 : 3
(C) 3 : 2 (D) 5 : 4

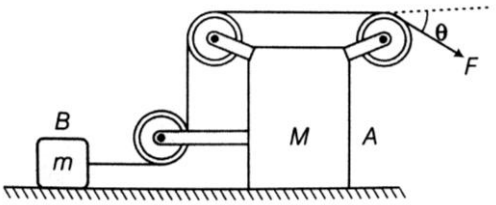
45. A wedge of mass M is free to move on smooth horizontal surface. Two blocks of mass m_1 and m_2 are free to move on smooth inclined surfaces of the wedge.



If $\frac{m_1}{m_2} = \frac{\sin 2\theta_2}{\sin 2\theta_1}$, the wedge

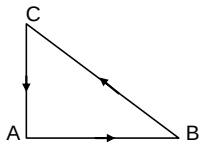
(A) remains stationary
(B) may accelerate left ward
(C) may accelerate rightward
(D) None of these

46. For the given arrangement, pulleys and string are light and smooth. All surfaces are smooth. Find the magnitude of acceleration of block A of mass M.



(A) $\frac{F(1-\cos\theta)}{M}$ (B) $\frac{F\cos\theta}{m+M}$
(C) $\frac{F\cos\theta}{m}$ (D) none of these

47. Three forces start acting simultaneously on a particle moving with velocity $\vec{v}$. These forces are represented in magnitude and direction by the three sides of a triangle ABC. The particle will now move with velocity

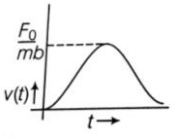


(A) less than $\vec{v}$ (B) greater than $\vec{v}$
(C) $|\vec{v}|$ in direction of largest force BC (D) $\vec{v}$ remaining unchanged

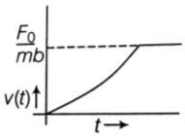
Space for rough work

48. A machine gun fires a bullet of mass 40 g with a velocity 1200 ms^{-1}. The man holding it, can exert a maximum force of 144 N on the gun. How many bullets can he fire per second at the most?
(A) 1 (B) 4 (C) 2 (D) 3

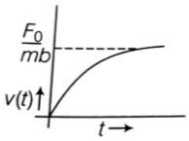
49. A particle of mass m is at rest at the origin at time t = 0. It is subjected to a force $F(t) = F_0e^{-bt}$ in the X–direction. Its speed v(t) is depicted by which of the following curves?



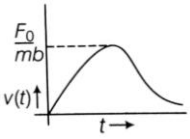
(A)



(B)

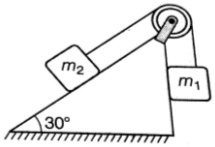


(C)

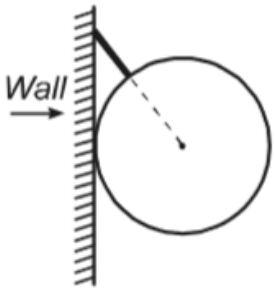


(D)

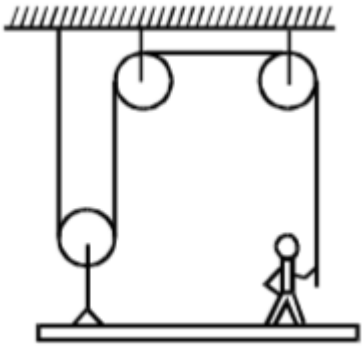
50. A block of mass 10 kg splits in two blocks of masses m_1 and m_2. Now they are connected through a massless string as shown in figure. For the maximum tension in the string, the ratio of m_1 and m_2 is
(A) 1 : 1 (B) 3 : 2
(C) 2 : 3 (D) 1 : 3



51. A uniform sphere of weight w and radius 3 m is being held by a string of length 2m attached to frictionless wall as shown in the figure. The tensions in the string will be
(A) 5w/4 (B) 15 w/4
(C) 15 w/ 16 (D) None of these

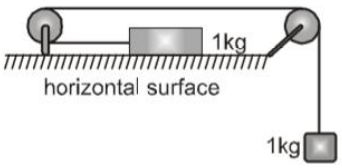


52. A 50 kg person stands on a 25kg platform. He pulls on the rope which is attached to the platform via the frictionless pulleys as shown in the fig. The platform moves upward at a steady rate if the force with which the person pulls the rope is _____
(A) 500 N (B) 250 N
(C) 25 N (D) 50 N



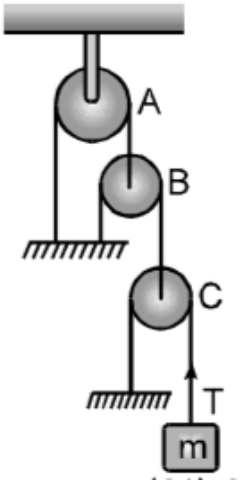
Space for rough work

53. Consider the system as shown in the figure. The pulley and the string are light and all the surfaces are frictionless. The tension in the string is (g=10 m/s^2)



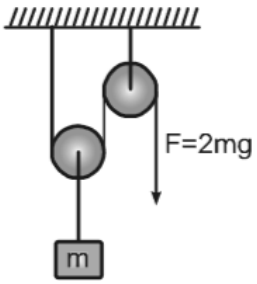
(A) 0 N (B) 1 N
(C) 2N (D) 5N

54. Pulleys A,B,C are connected to the mass as shown in figure. Tension in the rope connecting pulley A and pulley B is _____



(A) mg (B) 4 mg
(C) 8 mg (D) None of these

55. In the shown mass pulley system, pulley and string are massless. The one end of the string is pulled by the force F= 2mg. The acceleration of the block will be

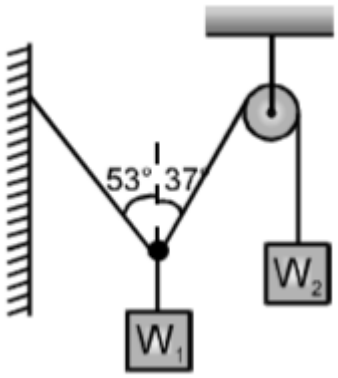


(A) g/2 (B) 0
(C) g (D) 3 g

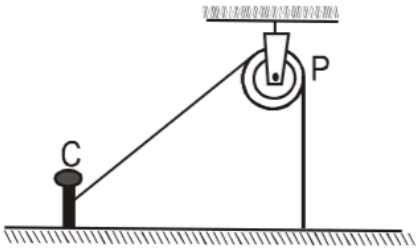
Space for rough work

56. A man slides down a light rope whose breaking strength in 1/5 times his weight. Then the maximum acceleration of man with which he can climb up so that the rope does not break is (g=acceleration due to gravity)
(A) 09 g (B) -0.8 g (C) 0.8 g (D) g

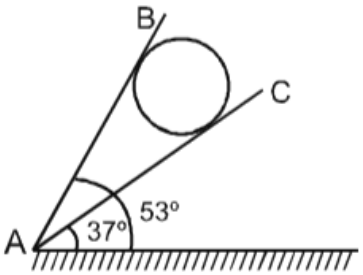
57. Two weights W_1 & W_2 in equilibrium and at rest, are suspended as shown in figure. Then the ratio $\frac{W_1}{W_2}$ is
(A) 5/4 (B) 4/5
(C) 8/5 (D) None of these



58. One end of massless rope, which passes over a massless and frictionless pulley P is tied to a hook C while the other end is free. Maximum tension that the rope can bear is 360 N. With what value of minimum safe acceleration (in ms^{-2}) can a man of 60 kg climb down the rope ?
(A) 16 (B) 6
(C) 4 (D) 8

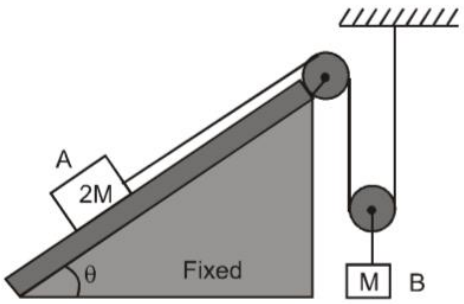


59. A sphere of mass m is held between two smooth inclined walls AB and AC. The normal reaction between wall AB and sphere is
(A) $\frac{15mg}{7}$ (B) $\frac{30mg}{7}$
(C) $\frac{10mg}{7}$ (D) None of these



Space for rough work

60. Calculate the acceleration of the block A. Assume all pulleys are massless and frictionless. All surfaces are smooth



(A) $\frac{2g}{9}(1-2\sin\theta)$ (B) $\frac{g}{9}(1-4\sin\theta)$

(C) $\frac{2g}{9}(1-4\sin\theta)$ (D) $\frac{g}{9}(1-2\sin\theta)$

61. The oxidation state of nitrogen varies from :
(A) –3 to +5 (B) 0 to +5 (C) –3 to 1 (D) +3 to +5

62. The halogen that shows same oxidation state in all its compounds with other element is :
(A) I_2 (B) F_2 (C) Cl_2 (D) Br_2

63. The charge on cobalt in $\left[Co(CN)_6\right]^{3-}$ is :
(A) –6 (B) +3 (C) –3 (D) +6

64. The oxidation number of S in $Na_2S_4O_6$ is :
(A) +2
(B) +2 and +3 (two S have +2 and other two have +3)
(C) +2 and +3 (three S have +2 and one S has +3)
(D) +5 and 0 (two S have +5 and the other two S have 0)

65. The oxidation number of sulphur in S_8, S_2F_2, H_2S respectively are :
(A) 0, +1 and –2 (B) +2, +1 and –2 (C) 0, +1 and +2 (D) –2, +1 and –2

66. Oxidation number of Cl in $NOClO_4$ is :
(A) +7 (B) –7 (C) +5 (D) –5

67. In which of the following compounds, the oxidation number of iodine is fractional ?
(A) IF_7 (B) I_3^- (C) IF_5 (D) IF_3

Space for rough work

68. Which ordering of compounds is according to the decreasing order of the oxidation state of nitrogen ?
(A) HNO_3, NO, NH_4Cl, N_2 (B) HNO_3, NO, N_2, NH_4Cl
(C) HNO_3, NH_4Cl, NO, N_2 (D) NO, HNO_3, NH_4Cl, N_2

69. The oxidation number of C in FeC_2O_4 is
(A) +1 (B) +2 (C) +4 (D) +3

70. A partially dried clay contains 50% silica and 5% H_2O. The original clay contained 15% of H_2O. The % of silica in the original sample is ?
(A) 44.7 (B) 54.7 (C) 43 (D) 53

71. 3.0 molal NaOH solution has a density of 1.110g/mL. The molarity of the solution is :
(A) 3 (B) 0.3 (C) 3.5 (D) 0.35

72. A hydrocarbon has 40% of carbon by weight. If molecular weight of the compound is 90, the number of carbon atoms present in 1 molecule of the compound are
(A) 3 (B) 2 (C) 1 (D) 5

73. In which compound, the oxidation number of nitrogen atoms is not different ?
(A) NH_4NO_3 (B) NH_4NO_2 (C) NH_2NH_2 (D) All

74. Which is NOT correct match ?

Compound	Oxidation state in underlined elements
(A) $\underline{N}H_4\underline{N}O_3$	–3, +5
(B) $CaO\underline{Cl}_2$	–1, +1
(C) $\underline{Cr}O_5$	+ 10
(D) $Na\underline{H}$	–1

75. The molarity of NO_3^- ion in the solution after 2.0 L of 3M $AgNO_3$ is mixed with 3L of 1.0 M $BaCl_2$ is
(A) 1.6 M (B) 1.2 M (C) 3.0 M (D) 1.0 M

Space for rough work

76. Which of the following gives the molarity of a 17% $\left(\frac{w}{w}\right)$ solution of CH_3COONa in water. The density of the solution is 1.09 gml^{-1} ?
(A) 2 .26 x 10^{-2} M (B) 0.207 M (C) 2. 07 M (D) 2.26 M

77. The simplest formula of a compound which consists of 1.2 x 10^{23} atoms of carbon, 3.6 x 10^{23} atoms of hydrogen and 6.02 x 10^{22} atoms of oxygen is
(A) $C_4H_{12}O_2$ (B) C_2H_6O (C) C_5H_5O (D) CH_2O

78. 3g of Mg is burnt in a closed vessel containing 3g of oxygen. The weight of reactant left unreacted is
(A) 0.5 g of oxygen (B) 1.0g of oxygen (C) 1.0g of Mg (D) 0.5 g Mg

79. The mole fraction of CH_3OH in an aqueous solution is 0.02 and its density is 0.994 gcm^{-3}. What are the molarity and molality respectively
(A) 1.08, 1.13 (B) 2.08, 2.13 (C) 0.108, 0.132 (D) 1.08, 2.13

80. A sugar syrup of weight 214.2 g contains 34.2g of sugar ($C_{12}H_{22}O_{11}$), then the mole fraction of the sugar in the syrup is
(A) 0.99 (B) 0.099 (C) 0.0099 (D) 0.01

81. The number of Na^+ ions are present in 50 mL of a 0.5 M solution of NaCl is
(A) 2.5 x 10^{22} (B) 6 x 10^{23} (C) 1.5 x 10^{22} (D) 25 x 10^{23}

82. The vapour density of 1 mol of mixture containing NO_2 and N_2O_4 is '30'. The moles of NO_2 in the mixture is :
(A) 0.3 (B) 0.7 (C) 0.5 (D) 0.2

83. Given the reaction: $N_2 + H_2 \rightarrow NH_3$; Calculate the volume of nitrogen needed to produce 6.8 gms of ammonia at STP
(A) 22.4Lt (B) 2.24Lt (C) 44.8Lt (D) 4.48Lt

Space for rough work

84. When a mixture of 10 moles of SO_2 and 15 moles of O_2 was passed over a catalyst, 8 moles of SO_3 was formed. The moles of SO_2 left after the reaction are $\left[SO_2 + O_2 \rightarrow SO_3\right]$

(A) 2 (B) 4 (C) 3 (D) 6

85. A compound has haemoglobin like structure. It has one Fe, It contain 4.6% of Fe. The approximate molecular mass is (Atomic mass of Fe = 56)

(A) 1400 g mol^{-1} (B) 1000g mol^{-1} (C) 1100 g mol^{-1} (D) 1200 g mol^{-1}

86. The crystalline salt $Na_2SO_4.xH_2O$ on heating loses 55.9 % of its weight. The formula of the crystalline salt is

(A) Na_2SO_4. $10H_2O$ (B) $Na_2SO_4.6H_2O$

(C) Na_2SO_4. $7H_2O$ (D) Na_2SO_4. $5H_2O$

87. Calculate the mass of anhydrous Na_2SO_4 present in 250 ml of 0.25 M solution.

(A) 19.37g (B) 20.37 g (C) 8.8g (D) 17.37g

88. Given that the abundance of isotopes ^{54}Fe, ^{56}Fe, and ^{57}Fe is 5%, 90%, and 5%, respectively. The average atomic mass of Fe is

(A) 56.85 (B) 55.95 (C) 54.25 (D) 57.25

89. In which of the following species 'Cr' shows its highest oxidation number ?

(i) $K_2Cr_2O_7$ (ii) K_2CrO_4 (iii) CrO_5 (iv) CrO_8^{3-}

(A) only i, ii (B) only i,ii, iii (C) all (D) only i, ii, iv

90. 600 ml of a mixture of O_3 and O_2 weighs 1g. at NTP. The volume of ozone in the mixture is

(A) 100 ml (B) 200 ml (C) 300 ml (D) 400 ml

Space for rough work

FIITJEE PET – VI (REG_1ST YEAR)

MAINS_SET–A_ANSWERS

DATE: 28.07.2018

MATHEMATICS

1.	**D**	2.	**B**	3.	**Bonus**	4.	**D**
5.	**D**	6.	**A**	7.	**A**	8.	**A**
9.	**A**	10.	**A**	11.	**D**	12.	**Bonus**
13.	**B**	14.	**BONUS**	15.	**A**	16.	**B**
17.	**D**	18.	**B**	19.	**D**	20.	**B**
21.	**A**	22.	**A**	23.	**B**	24.	**C**
25.	**A**	26.	**C**	27.	**D**	28.	**B**
29.	**D**	30.	**A**				

PHYSICS

31.	**B**	32.	**B**	33.	**C**	34.	**A**
35.	**D**	36.	**B**	37.	**C**	38.	**C**
39.	**C**	40.	**C**	41.	**D**	42.	**D**
43.	**B**	44.	**D**	45.	**A**	46.	**A**
47.	**D**	48.	**D**	49.	**C**	50.	**A**
51.	**A**	52.	**B**	53.	**D**	54.	**B**
55.	**D**	56.	**B**	57.	**A**	58.	**C**
59.	**A**	60.	**C**				

CHEMISTRY

61.	**A**	62.	**B**	63.	**B**	64.	**D**
65.	**A**	66.	**A**	67.	**B**	68.	**B**
69.	**D**	70.	**A**	71.	**A**	72.	**A**
73.	**C**	74.	**C**	75.	**B**	76.	**D**
77.	**B**	78.	**B**	79.	**A**	80.	**C**
81.	**C**	82.	**B**	83.	**D**	84.	**A**
85.	**D**	86.	**A**	87.	**C**	88.	**B**
89.	**B**	90.	**B**				

FIITJEE PET – VI (REG_1ST YEAR)

MAINS_SET–B

DATE: 28.07.2018

Time: 3 hours **Maximum Marks: 360**

INSTRUCTIONS:

Instructions to the Candidates

1. This Test Booklet consists of **90 questions**.

   Use **Blue/Black ball Point Pen only** for writing particulars and bubbling of OMR.

2. For each correct answer **4 Marks** will awarded and for each wrong answer **1 Mark** will be deducted.

3. Attempt all questions.

4. In case you have not darkened any bubble you will be awarded 0 mark for that question.

5. Use of calculator/logarithmic table is not permitted.

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.: ☐☐☐☐☐☐☐☐☐☐

1. The points (–a, –b), (0, 0), (a, b) and (a^2, ab) are
   (A) collinear (B) vertices of a parallelogram
   (C) vertices of a rectangle (D) none of these

2. Let the vertices of a triangle be (0, 0), (3, 0) and (0, 4). Its orthocenter is
   (A) (0, 0) (B) $\left(1,\frac{4}{3}\right)$ (C) $\left(\frac{3}{2},2\right)$ (D) none of these

3. The area enclosed by |x| + |y| = 1 is
   (A) 1 (B) 2 (C) 3 (D) 4

4. The nearest point on the line 3x + 4y = 25 from the origin is
   (A) (–4, 5) (B) (3, –4) (C) (3, 4) (D) (3, 5)

5. The point of intersection of the lines $\frac{x}{a}+\frac{y}{b}=1$ and $\frac{x}{b}+\frac{y}{a}=1$ lies on the line
   (A) x – y = 0 (B) (x – y)(a + b) = 2ab
   (C) (ℓx + my)(a – b) = (ℓ + m)ab (D) (ℓx – my)(a – b) = (1 – m)ab

6. The line 3x + 2y = 24 meets y-axis at A and x-axis at B. The perpendicular bisector of AB meets the line through (0, –1) parallel to x-axis at C. The area of the triangle ABC is
   (A) 182 sq. units (B) 91 sq. units (C) 48 sq. units (D) None of these

7. A line L passes through the points (1, 1) and (2, 0) and another line L′ passes through $\left(\frac{1}{2},0\right)$ and perpendicular to L. Then the area of the triangle formed by the lines L, L′ and y- axis, is
   (A) 15/8 (B) 25/4 (C) 25/8 (D) 25/16

8. The coordinates of the foot of perpendicular from (a, 0) on the line y = mx + $\frac{a}{m}$ is/are
   (A) $\left(0,-\frac{1}{a}\right)$ (B) $\left(0,\frac{a}{m}\right)$ (C) $\left(0,-\frac{a}{m}\right)$ (D) $\left(0,\frac{1}{a}\right)$

9. Image of the point (4, –3) with respect to the line y = x is
   (A) (–4, –3) (B) (3, 4) (C) (–4, 3) (D) (–3, 4)

Space for rough work

10. The points A(2a, 4a), B(2a, 6a), C(2a + $\sqrt{3}$ a, 5a), a > 0 are the vertices of
(A) a right angled triangle (B) an equilateral triangle
(C) an isosceles triangle (D) none of these

11. Let PS be the median of the triangle with vertices P(2, 2), Q(6, –1) and R(7, 3). The equation of the line passing through (1, –1) and parallel to PS, is
(A) 2x – 9y – 7 = 0 (B) 2x – 9y – 11 = 0 (C) 2x + 9y – 11 = 0 (D) 2x + 9y + 7 = 0

12. The point P(a, b) lies on the straight line 3x + 2y = 13 and the point Q(b, a) lies on the straight line 4x – y = 5, then the equation of the line PQ is
(A) x – y = 5 (B) x + y = 5 (C) x + y = –5 (D) x – y = –5

13. The locus of the mid-point of the portion intercepted between the axes by the x cos α + y sin α = p, where p is a constant is
(A) $x^2 + y^2 = 4p^2$ (B) $\frac{1}{x^2}+\frac{1}{y^2}=\frac{1}{p^2}$ (C) $x^2 + y^2 = \frac{4}{p^2}$ (D) $\frac{1}{x^2}+\frac{1}{y^2}=\frac{2}{p^2}$

14. If A(1, 1), $B\left(\sqrt{3}+1,2\right)$ and $C\left(\sqrt{3},\sqrt{3}+2\right)$ be three vertices of a square, then the diagonal through B is
(A) $y = \left(\sqrt{3}-2\right)x+\left(3-\sqrt{3}\right)$ (B) y = 0
(C) y = x (D) none of these

15. The equation of a straight line passing through the point of intersection of x – y + 1 = 0 and 3x + y – 5 = 0 and perpendicular to one of them, is
(A) x + y + 3 = 0 (B) x – y – 3 = 0 (C) x – 3y – 5 = 0 (D) x – 3y + 5 = 0

16. The equations of the lines through (–1, –1) and making angles 45° with the line x + y = 0 are given by
(A) x + 1 = 0, x – y = 0 (B) y + 1 = 0, x – y = 0 (C) x + 1 = 0, y + 1 = 0 (D) none of these

17. A straight line through P(1, 2) is such that its intercept between the axes is bisected at P. Its equation is
(A) x + 2y = 5 (B) x – y + 1 = 0 (C) x + y – 3 = 0 (D) 2x + y – 4 = 0

18. The ratio in which the line 3x – 4y + 5 = 0 divides the line segment joining the points (2, –4), (–3, 1) is
(A) 26 : 9 (B) 27 : 8 (C) 24 : 7 (D) 22 : 6

19. A line L cuts the sides AB, BC of ABC in the ratio 2 : 5, 7 : 4 respectively, then the line L cuts CA in the ratio
(A) 7 : 10 (B) 7 : –10 (C) 10 : 7 (D) 10 : –7

Space for rough work

20. If the lines joining any point O to vertices A, B, C of a triangle meet the opposite sides in D, E, F respectively, then $\frac{BD}{DC}.\frac{CE}{EA}.\frac{AF}{FB}$ =
(A) 1 (B) 2 (C) –3 (D) 3

21. The ends of the base of an isosceles triangle are at (2a, 0) and (0, a). The equation of one side is x = 2a. The equation of the other side is
(A) x + 2y – a = 0 (B) x + 2y = 2a (C) 3x + 4y – 4a = 0 (D) 3x – 4y + 4a = 0

22. y = mx + 5 be a line then the range of m so that points (5, 6) and (–6, 6) always lies on the same side of the origin is
(A) $m > \frac{1}{5} \text{ or } m < \frac{-1}{4}$ (B) $m > \frac{1}{4} \text{ or } m < \frac{-1}{5}$ (C) $-\frac{1}{4} < m < \frac{1}{5}$ (D) $m > \frac{1}{5} \text{ or } m < \frac{-1}{6}$

23. The vertex of an equilateral triangle is (2,–1) and the equation of its base in x + 2y = 1. The length of its sides is
(A) $\frac{4}{\sqrt{15}}$ (B) $\frac{2}{\sqrt{15}}$ (C) $\frac{4}{3\sqrt{3}}$ (D) $\frac{1}{\sqrt{5}}$

24. Two points A and B have coordinates (1, 1) and (3, –2) respectively. The co-ordinates of a point distant $\sqrt{85}$ from B on the line through B perpendicular to AB are
(A) (4, 7) (B) (7, 4) (C) (5, 7) (D) (–5, –3)

25. If (– 2, 6) is the image of the point (4, 2) with respect to line L = 0, then L =
(A) 3x – 2y + 5 (B) 3x – 2y + 10 (C) 2x + 3y – 5 (D) 6x – 4y – 7

26. The equation of the line with slope $-\frac{3}{2}$ which is concurrent with the line 4x + 3y – 7 = 0 and 8x + 5y – 1 = 0 is
(A) 3x + 2y – 2 = 0 (B) 3x + 2y – 63 = 0 (C) 2y – 3x – 2 = 0 (D) none of these

27. The equation of lines parallel to x + 7y + 2 = 0 and at a unit distance from the point (7, –1) are
(A) $x + 7y \pm 5\sqrt{2} = 0$ (B) $x + 7y \pm 5 = 0$ (C) $x + 7y \pm 6\sqrt{2} = 0$ (D) $x + 7y \pm 6 = 0$

28. Two points (a, 0) and (0, b) are joined by a straight line. Another point on this line, is
(A) (3a, –2b) (B) (a^2, ab) (C) (–3a, 2b) (D) (a, b)

Space for rough work

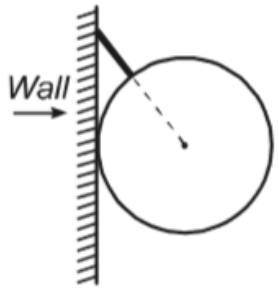
29. If the line segment joining (2, 3) and (–1, 2) is divided internally in the ratio 3 : 4 by the line $x + 2y = \lambda$, then λ =

(A) $\frac{41}{7}$ (B) $\frac{5}{7}$ (C) $\frac{36}{7}$ (D) $\frac{31}{7}$

30. A line is such that its segment between the straight lines $5x – y – 4 = 0$ and $3x + 4y – 4 = 0$ is bisected at the point (1, 5), then its equation is

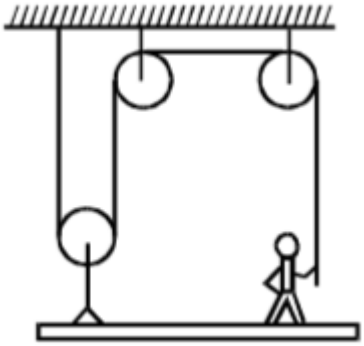
(A) $83x – 35y + 92 = 0$ (B) $35x – 83y + 92 = 0$ (C) $35x + 35y + 92 = 0$ (D) None of these

31. A uniform sphere of weight w and radius 3 m is being held by a string of length 2m attached to frictionless wall as shown in the figure. The tensions in the string will be



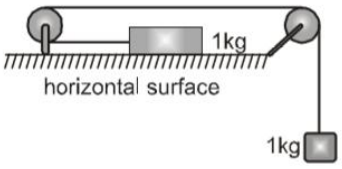
(A) 5w/4 (B) 15 w/4
(C) 15 w/ 16 (D) None of these

32. A 50 kg person stands on a 25kg platform. He pulls on the rope which is attached to the platform via the frictionless pulleys as shown in the fig. The platform moves upward at a steady rate if the force with which the person pulls the rope is _____



(A) 500 N (B) 250 N
(C) 25 N (D) 50 N

33. Consider the system as shown in the figure. The pulley and the string are light and all the surfaces are frictionless. The tension in the string is ($g=10\ m/s^2$)

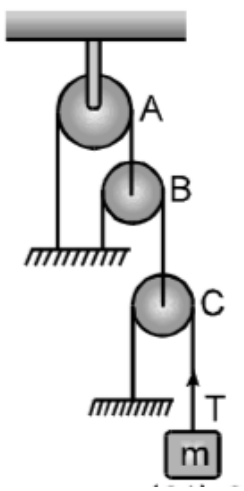


(A) 0 N (B) 1 N
(C) 2N (D) 5N

Space for rough work

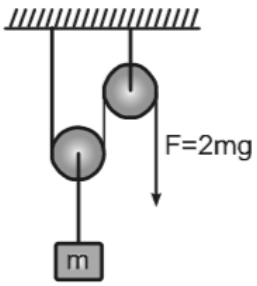
34. Pulleys A,B,C are connected to the mass as shown in figure. Tension in the rope connecting pulley A and pulley B is _____

(A) mg (B) 4 mg
(C) 8 mg (D) None of these



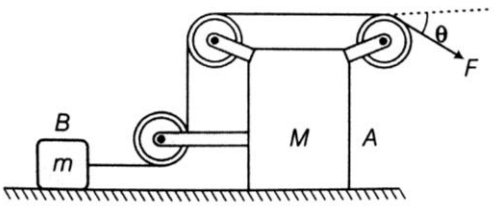
35. In the shown mass pulley system, pulley and string are massless. The one end of the string is pulled by the force F= 2mg. The acceleration of the block will be

(A) g/2 (B) 0
(C) g (D) 3 g



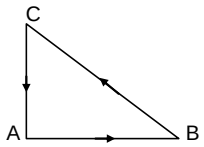
36. For the given arrangement, pulleys and string are light and smooth. All surfaces are smooth. Find the magnitude of acceleration of block A of mass M.

(A) $\frac{F(1-\cos\theta)}{M}$ (B) $\frac{F\cos\theta}{m+M}$
(C) $\frac{F\cos\theta}{m}$ (D) none of these



37. Three forces start acting simultaneously on a particle moving with velocity $\vec{v}$. These forces are represented in magnitude and direction by the three sides of a triangle ABC. The particle will now move with velocity

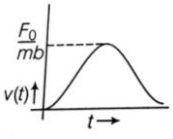
(A) less than $\vec{v}$ (B) greater than $\vec{v}$
(C) $|\vec{v}|$ in direction of largest force BC (D) $\vec{v}$ remaining unchanged



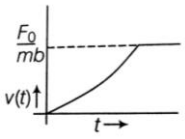
Space for rough work

38. A machine gun fires a bullet of mass 40 g with a velocity 1200 ms^{-1}. The man holding it, can exert a maximum force of 144 N on the gun. How many bullets can he fire per second at the most?
(A) 1 (B) 4 (C) 2 (D) 3

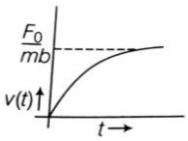
39. A particle of mass m is at rest at the origin at time t = 0. It is subjected to a force $F(t) = F_0e^{-bt}$ in the X–direction. Its speed v(t) is depicted by which of the following curves?



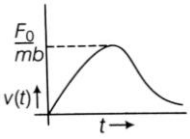
(A)



(B)

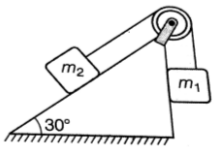


(C)

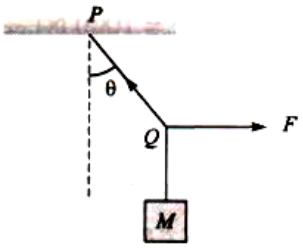


(D)

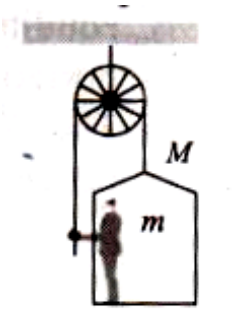
40. A block of mass 10 kg splits in two blocks of masses m_1 and m_2. Now they are connected through a massless string as shown in figure. For the maximum tension in the string, the ratio of m_1 and m_2 is
(A) 1 : 1 (B) 3 : 2
(C) 2 : 3 (D) 1 : 3



41. A mass M is suspended by a rope from a rigid support at P as shown in fig. Another rope is tied at the end Q, and it is pulled horizontally with a force F. If the rope PQ makes angle θ with the vertical, then the tension in the string PQ is
(A) $F\sin\theta$ (B) $F/\sin\theta$
(C) $F\cos\theta$ (D) $F/\cos\theta$

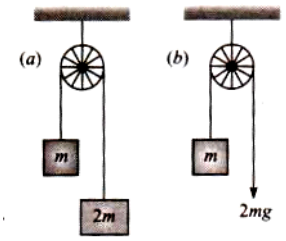


42. A man of mass m stands on a crate of mass M. He pulls on a light rope passing over a smooth light pulley. The other end of the rope is attached to the crate. For the system to be in equilibrium, the force exerted by the man on the rope will be
(A) $(M+m)g$ (B) $\frac{1}{2}(M+m)g$
(C) Mg (D) mg



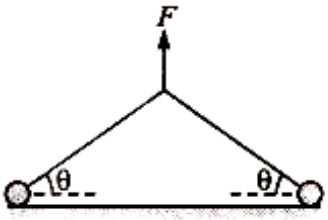
Space for rough work

43. The two pulley arrangements shown in fig are identical. The mass of the rope is negligible. In (a) the mass m is lifted up by attaching a mass 2 m to the other end of the rope. In (b) m is lifted up by pulling the other end of the rope with a constant downward force of 2mg. The ratio of accelerations in two cases will be



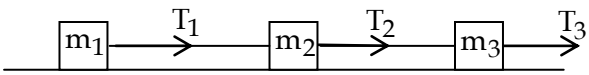
(A) 1 :1 (B) 1 :2
(C) 1:3 (D) 1:4

44. Two small spheres each of mass m connected by a string of length 2ℓ are kept on a smooth horizontal surface. A vertical force F is applied at the middle of the string. What is maximum value of F for which the sphere do not lose contact wit the surface ?



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

45 Three blocks of masses m_1, m_2 and m_3 are connected by massless strings on a frictionless table. They are pulled with a force $T_3 = 40N$. If $m_1 = 10kg$, $m_2 = 6kg$ and $m_3 = 4kg$, the tension T_2 will be



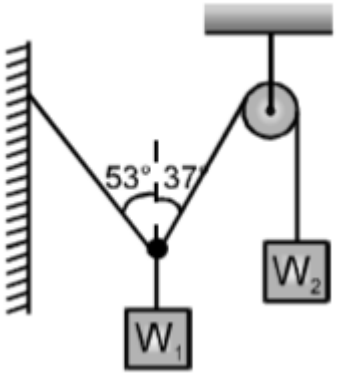
(A) 20 N (B) 40 N (C) 10 N (D) 32N

46. A man slides down a light rope whose breaking strength in 1/5 times his weight. Then the maximum acceleration of man with which he can climb up so that the rope does not break is (g=acceleration due to gravity)

(A) 09 g (B) -0.8 g (C) 0.8 g (D) g

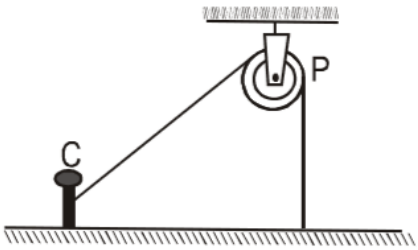
Space for rough work

47. Two weights W_1 & W_2 in equilibrium and at rest, are suspended as shown in figure. Then the ratio $\frac{W_1}{W_2}$ is



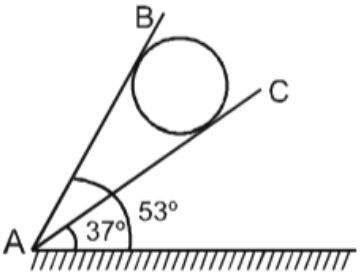
(A) 5/4 (B) 4/5
(C) 8/5 (D) None of these

48. One end of massless rope, which passes over a massless and frictionless pulley P is tied to a hook C while the other end is free. Maximum tension that the rope can bear is 360 N. With what value of minimum safe acceleration (in ms^{-2}) can a man of 60 kg climb down the rope ?



(A) 16 (B) 6
(C) 4 (D) 8

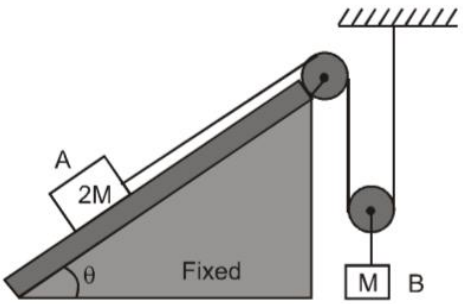
49. A sphere of mass m is held between two smooth inclined walls AB and AC. The normal reaction between wall AB and sphere is



(A) $\frac{15mg}{7}$ (B) $\frac{30mg}{7}$
(C) $\frac{10mg}{7}$ (D) None of these

Space for rough work

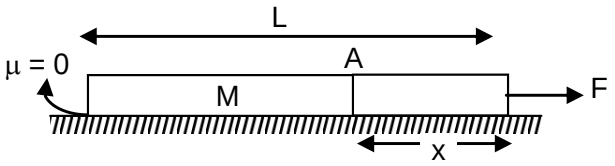
50. Calculate the acceleration of the block A. Assume all pulleys are massless and frictionless. All surfaces are smooth



(A) $\frac{2g}{9}(1-2\sin\theta)$ (B) $\frac{g}{9}(1-4\sin\theta)$

(C) $\frac{2g}{9}(1-4\sin\theta)$ (D) $\frac{g}{9}(1-2\sin\theta)$

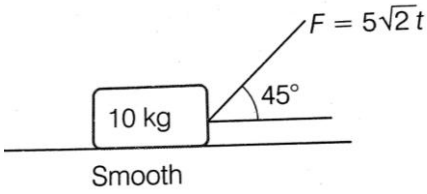
51. Find the tension in rope at section A, at a distance x from the right end $\left(x=\frac{3L}{4}\right)$



(A) F (B) $\frac{3F}{4}$ (C) $\frac{F}{3}$ (D) $\frac{F}{4}$

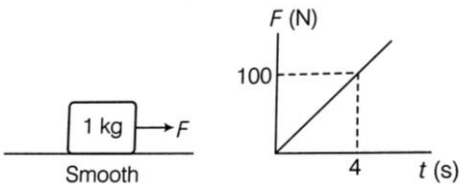
52. A force F = $5\sqrt{2}$ t N is applied on the block as shown in the figure. The block starts from rest at t = 0, then

(A) the block leaves the horizontal surface at t = 20 s
(B) the block never leaves the horizontal surface
(C) the velocity of block at t = 20 s is 100 m/s
(D) both a and c are correct



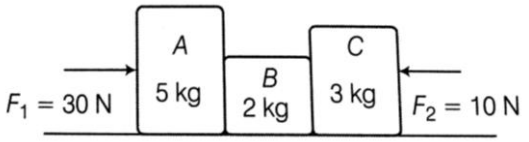
53. The force F which is applied to 1 kg block initially at rest varies linearly with time as shown in the figure. Find velocity of the block at t = 4 s.

(A) 100 m/s (B) 200 m/s
(C) 20 m/s (D) 4 m/s



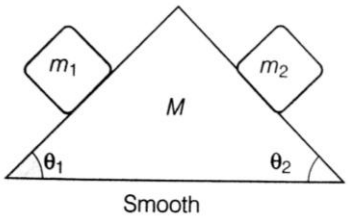
Space for rough work

54. The figure shows three blocks in contact and placed on a smooth horizontal fixed table. The ratio of force exerted by block A to B and the force by block B to C is



(A) 1 : 2 (B) 2 : 3
(C) 3 : 2 (D) 5 : 4

55. A wedge of mass M is free to move on smooth horizontal surface. Two blocks of mass m_1 and m_2 are free to move on smooth inclined surfaces of the wedge.



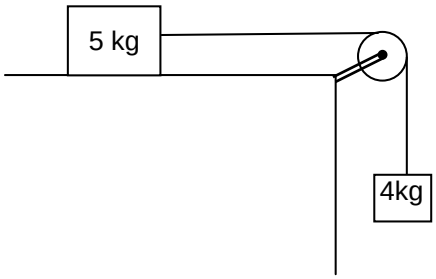
If $\frac{m_1}{m_2} = \frac{\sin 2\theta_2}{\sin 2\theta_1}$, the wedge

(A) remains stationary
(B) may accelerate left ward
(C) may accelerate rightward
(D) None of these

56. A 500 g ball moving at 15 m/s slows down uniformly until it stops. If the ball travels 15m, what was the average net force applied while it was coming to a stop?

(A) 0.375 N (B) 3.75 N (C) 37.5 N (D) 6.25 N

57. Two masses of 4 kg and 5 kg are connected by a string passing through frictionless pulley as shown. Find the acceleration of 5 kg mass



(A) $\frac{2g}{9}$ (B) $\frac{g}{9}$

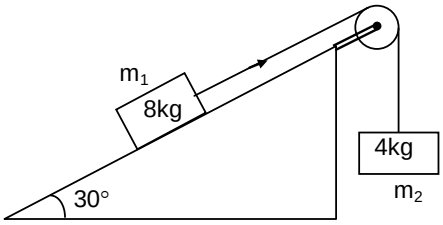
(C) $\frac{4g}{9}$ (D) g

58. Two masses of 2 kg and 3 kg are attached to the end of the string passed over a pulley fixed at the top. The tension and acceleration are(in SI units)

(A) $\frac{7g}{8}, \frac{g}{8}$ (B) $\frac{21g}{8}, \frac{g}{8}$ (C) $\frac{12g}{5}, \frac{g}{5}$ (D) $\frac{12g}{8}, \frac{g}{5}$

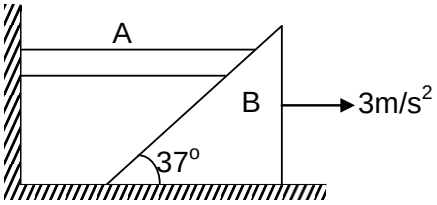
Space for rough work

59. Two masses of 8 kg and 4 kg are connected by a string as shown in figure over a frictionless pulley. The acceleration of the system is



(A) 4 m/s^2 (B) 2 m/s^2
(C) zero (D) 9.8 m/s^2

60. In the given figure direction of the acceleration of A



(A) towards right (B) towards left
(C) downward (D) upward

61. The number of Na^+ ions are present in 50 mL of a 0.5 M solution of NaCl is
(A) 2.5 x 10^{22} (B) 6 x 10^{23} (C) 1.5 x 10^{22} (D) 25 x 10^{23}

62. The vapour density of 1 mol of mixture containing NO_2 and N_2O_4 is '30'. The moles of NO_2 in the mixture is :
(A) 0.3 (B) 0.7 (C) 0.5 (D) 0.2

63. Given the reaction: $N_2 + H_2 \rightarrow NH_3$; Calculate the volume of nitrogen needed to produce 6.8 gms of ammonia at STP
(A) 22.4Lt (B) 2.24Lt (C) 44.8Lt (D) 4.48Lt

64. When a mixture of 10 moles of SO_2 and 15 moles of O_2 was passed over a catalyst, 8 moles of SO_3 was formed. The moles of SO_2 left after the reaction are $\left[SO_2 + O_2 \rightarrow SO_3\right]$
(A) 2 (B) 4 (C) 3 (D) 6

65. A compound has haemoglobin like structure. It has one Fe, It contain 4.6% of Fe. The approximate molecular mass is (Atomic mass of Fe = 56)
(A) 1400 g mol^{-1} (B) 1000g mol^{-1} (C) 1100 g mol^{-1} (D) 1200 g mol^{-1}

Space for rough work

66. Which of the following gives the molarity of a 17% $\left(\frac{w}{w}\right)$ solution of CH_3COONa in water. The density of the solution is 1.09 gml^{-1} ?
(A) 2 .26 x 10^{-2} M (B) 0.207 M (C) 2. 07 M (D) 2.26 M

67. The simplest formula of a compound which consists of 1.2 x 10^{23} atoms of carbon, 3.6 x 10^{23} atoms of hydrogen and 6.02 x 10^{22} atoms of oxygen is
(A) $C_4H_{12}O_2$ (B) C_2H_6O (C) C_5H_5O (D) CH_2O

68. 3g of Mg is burnt in a closed vessel containing 3g of oxygen. The weight of reactant left unreacted is
(A) 0.5 g of oxygen (B) 1.0g of oxygen (C) 1.0g of Mg (D) 0.5 g Mg

69. The mole fraction of CH_3OH in an aqueous solution is 0.02 and its density is 0.994 gcm^{-3}. What are the molarity and molality respectively
(A) 1.08, 1.13 (B) 2.08, 2.13 (C) 0.108, 0.132 (D) 1.08, 2.13

70. A sugar syrup of weight 214.2 g contains 34.2g of sugar ($C_{12}H_{22}O_{11}$), then the mole fraction of the sugar in the syrup is
(A) 0.99 (B) 0.099 (C) 0.0099 (D) 0.01

71. The oxidation state of nitrogen varies from
(A) –3 to +5 (B) 0 to +5 (C) –3 to 1 (D) +3 to +5

72. The halogen that shows same oxidation state in all its compounds with other element is :
(A) I_2 (B) F_2 (C) Cl_2 (D) Br_2

73. The charge on cobalt in $\left[Co(CN)_6\right]^{3-}$ is
(A) –6 (B) +3 (C) –3 (D) +6

74. The oxidation number of S in $Na_2S_4O_6$ is
(A) +2
(B) +2 and +3 (two S have +2 and other two have +3)
(C) +2 and +3 (three S have +2 and one S has +3)
(D) +5 and 0 (two S have +5 and the other two S have 0)

75. The oxidation number of sulphur in S_8, S_2F_2, H_2S respectively are
(A) 0, +1 and –2 (B) +2, +1 and –2 (C) 0, +1 and +2 (D) –2, +1 and –2

Space for rough work

76. The crystalline salt $Na_2SO_4.xH_2O$ on heating loses 55.9 % of its weight. The formula of the crystalline salt is
(A) $Na_2SO_4.\ 10H_2O$ (B) $Na_2SO_4.6H_2O$
(C) $Na_2SO_4.\ 7H_2O$ (D) $Na_2SO_4.\ 5H_2O$

77. Calculate the mass of anhydrous Na_2SO_4 present in 250 ml of 0.25 M solution.
(A) 19.37g (B) 20.37 g (C) 8.8g (D) 17.37g

78. Given that the abundance of isotopes ^{54}Fe, ^{56}Fe, and ^{57}Fe is 5%, 90%, and 5%, respectively. The average atomic mass of Fe is
(A) 56.85 (B) 55.95 (C) 54.25 (D) 57.25

79. In which of the following species 'Cr' shows its highest oxidation number ?
(i) $K_2Cr_2O_7$ (ii) K_2CrO_4 (iii) CrO_5 (iv) CrO_8^{3-}
(A) only i, ii (B) only i,ii, iii (C) all (D) only i, ii, iv

80. 600 ml of a mixture of O_3 and O_2 weighs 1g. at NTP. The volume of ozone in the mixture is
(A) 100 ml (B) 200 ml (C) 300 ml (D) 400 ml

81. 3.0 molal NaOH solution has a density of 1.110g/mL. The molarity of the solution is :
(A) 3 (B) 0.3 (C) 3.5 (D) 0.35

82. A hydrocarbon has 40% of carbon by weight. If molecular weight of the compound is 90, the number of carbon atoms present in 1 molecule of the compound are
(A) 3 (B) 2 (C) 1 (D) 5

83. In which compound, the oxidation number of nitrogen atoms is not different ?
(A) NH_4NO_3 (B) NH_4NO_2 (C) NH_2NH_2 (D) All

Space for rough work

84. Which is NOT correct match ?

Compound	Oxidation state in underlined elements
(A) $\underline{N}H_4\underline{N}O_3$	–3, +5
(B) $CaO\underline{Cl}_2$	–1, +1
(C) $\underline{Cr}O_5$	+ 10
(D) $Na\underline{H}$	–1

85. The molarity of NO_3^- ion in the solution after 2.0 L of 3M $AgNO_3$ is mixed with 3L of 1.0 M $BaCl_2$ is

(A) 1.6 M (B) 1.2 M (C) 3.0 M (D) 1.0 M

86. Oxidation number of Cl in $NOClO_4$ is

(A) +7 (B) –7 (C) +5 (D) –5

87. In which of the following compounds, the oxidation number of iodine is fractional ?

(A) IF_7 (B) I_3^- (C) IF_5 (D) IF_3

88. Which ordering of compounds is according to the decreasing order of the oxidation state of nitrogen ?

(A) HNO_3, NO, NH_4Cl, N_2 (B) HNO_3, NO, N_2, NH_4Cl
(C) HNO_3, NH_4Cl, NO, N_2 (D) NO, HNO_3, NH_4Cl, N_2

89. The oxidation number of C in FeC_2O_4 is

(A) +1 (B) +2 (C) +4 (D) +3

90. A partially dried clay contains 50% silica and 5% H_2O. The original clay contained 15% of H_2O. The % of silica in the original sample is ?

(A) 44.7 (B) 54.7 (C) 43 (D) 53

Space for rough work

FIITJEE PET – VI (REG_1ST YEAR)

MAINS_SET–B_ANSWERS

DATE: 28.07.2018

MATHEMATICS

1.	**A**	2.	**A**	3.	**B**	4.	**C**
5.	**A**	6.	**B**	7.	**D**	8.	**B**
9.	**D**	10.	**B**	11.	**D**	12.	**B**
13.	**Bonus**	14.	**D**	15.	**D**	16.	**C**
17.	**D**	18.	**B**	19.	**D**	20.	**A**
21.	**D**	22.	**Bonus**	23.	**B**	24.	**Bonus**
25.	**A**	26.	**A**	27.	**A**	28.	**A**
29.	**A**	30.	**A**				

PHYSICS

31.	**A**	32.	**B**	33.	**D**	34.	**B**
35.	**D**	36.	**A**	37.	**D**	38.	**D**
39.	**C**	40.	**A**	41.	**B**	42.	**B**
43.	**C**	44.	**A**	45.	**D**	46.	**B**
47.	**A**	48.	**C**	49.	**A**	50.	**C**
51.	**D**	52.	**D**	53.	**B**	54.	**D**
55.	**A**	56.	**B**	57.	**C**	58.	**C**
59.	**C**	60.	**C**				

CHEMISTRY

61.	**C**	62.	**B**	63.	**D**	64.	**A**
65.	**D**	66.	**D**	67.	**B**	68.	**B**
69.	**A**	70.	**C**	71.	**A**	72.	**B**
73.	**B**	74.	**D**	75.	**A**	76.	**A**
77.	**C**	78.	**B**	79.	**B**	80.	**B**
81.	**A**	82.	**A**	83.	**C**	84.	**C**
85.	**B**	86.	**A**	87.	**B**	88.	**B**
89.	**D**	90.	**A**				