Dr.K.K.R GOWTHAM (E.M) HIGH SCHOOL :: AP & TS

Class: 8-A1, A2 **Marks : 100M**

Subject: MATHS, PHYSICS, CHEMISTRY **Time: 1 ½ hr**

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Name of the Student: _____ ***Sec:*** _____ ***G.C.S. .*** _____

I. Choose the correct answer 50x2=100M

1. If two vertices of a triangle are (-2,3) and (5,-1) orthocenter lies at the origin and centroid on the line x+y=7, then the third vertex lies at [ ]

   a) (7,4) b. (8,14) c. (12,21) d. none of these

2. The centroid of an equilateral triangle is (0,0). If two vertices of the triangle lie on $x+y = 2\sqrt{2}$ then one of then will have its co ordinates. [ ]

   a. $\left(\sqrt{2}+\sqrt{6},\sqrt{2}-\sqrt{6}\right)$ b. $\left(\sqrt{2}+\sqrt{3},\sqrt{2}-\sqrt{3}\right)$ c. $\left(\sqrt{2}+\sqrt{5},\sqrt{2}-\sqrt{5}\right)$ d. none

3. A line 'L' is drawn from P (4,3) to meet the lines L_1 and L_2 given by 3x+4y+5=0 and 3x+4y+15=0 at points A and B respectively. From A, a line perpendicular to L is drawn meeting the line L_2 at A_1. Similarly from point 'B' , a line perpendicular to L is drawn meeting the line L_1 and B_1. Thus a parallelogram AA_1BB_1 is formed. Then the equation of 'L' so that the area of the parallelogram AA_1BB_1 is least is [ ]

   a. x-7y+17=0 b. 7x+y+31=0 c. x-7y-17=0 d. x+7y-31=0

4. A line cuts the x axis at A (7,0) and the y axis at B (0,-5). A variable line PQ is drawn perpendicular to AB cutting the x axis at P and the y axis at Q. If AQ and BP intersect at R, then find the locus of R.

   a. $x+y^2-7x+5y=0$ c. $x^2-y^2-7x+5y=0$

   b. $x+y^2+7x+5y=0$ d. $x^2-y^2-7x-5y=0$

5. The equation of the bisector of the acute angle between the lines 2x-y+4=0 and x-2y =1 is

   a. x+y+5=0 b. x-y+1=0 c. x-y=5 d. none of these [ ]

6. L_1 and L_2 are two lines. If the reflection of 4 in L_2 and the reflection of L_2 in 4 coincide, then the angle between the lines is [ ]

   a. 30^0 b. 60^0 c. 45^0 d. 90^0

7. If $\frac{x}{\cos\theta} = \frac{y}{\cos\left(\theta-\frac{2\pi}{3}\right)} = \frac{z}{\cos\left(\theta+\frac{2\pi}{3}\right)}$, then x+y+z is equal to [ ]

   a. 1 b. 0 c. -1 d. none of these

8. Let x= $\sin 1^0$, then the value of the expression $\frac{1}{\cos 0^0.\cos 1^0}+\frac{1}{\cos 1^0.\cos 2^0}+\frac{1}{\cos 2^0.\cos 3^0}.....\frac{1}{\cos 44^0.\cos 45^0}$ is equal to [ ]

   a. x b. 1/x c. $\frac{\sqrt{2}}{x}$ d. $\frac{x}{\sqrt{2}}$

9. Orthocentre of the Δ^{le} whose vertices are (2, - ½) (½ , -1/2) (2, $\frac{\sqrt{3}-1}{2}$) is [ ]

a. (2, -½) b. (½ , - ½) c. (2, -$\frac{\sqrt{3}-1}{2}$) d. (½ , - $\frac{\sqrt{3}-1}{2}$)

10. If A (1,2) B (-4,2). Number of points P in the plane such that $\angle$ APB = $\frac{\pi}{2}$ and area of the ΔAPB is 7 sq. units is [ ]

a. 0 b. 2 c. 3 d. 4

11. In ΔABC, B (1,2) , C(5,6) and the internal bisector of the angle A cuts BC at D(4,5) then $\frac{AB}{AC}$ = [ ]

a. 2:1 b. 3:1 c. 1:3 d. -3:1

12. The number of lines that can be drawn through the point (4, $\sqrt{13}$) at a distance of 3 units from the point (-2,0) is [ ]

a. 0 b. 1 c. 2 d. infinite

13. The equation of the st. lines through the point (2,3) and making an intercept of length 3 between the lines 4x+3y=3 and 4x+3y=12 is [ ]

a. 7x+24y+86=0 c. 7x-24y-86=0

b. 7x+24y-86=0 d. 7x-24y+86=0

14. A straight line through the origin O meets the parallel lines 4x+2y=9 and 2x+y+6=0 at points P and Q respectively. Then the point O divides the segment PQ in the ratio. [ ]

a. 1:2 b. 3:4 c. 2:1 d. 4:3

15. A variable straight line drawn through point of intersection of the straight lines $\frac{x}{a}+\frac{y}{b}=1$ and $\frac{x}{b}+\frac{y}{a}=1$ meets the axes in A and B. the locus of midpoint of AB is [ ]

a. xy (a+b) xy b.(a+b)xy = ab (x+y)

b. ab(x+y) = 2 (a+b)xy d. abxy = (a+b) (x+y)

16. Given P= (a,0) and Q= (-a,0) and R is a variable point on one side of the line PQ such that $\angle$ RPQ - $\angle$RQP= 2α . the locus of the point R is [ ]

a. $x^2+y^2+2xy\cot 2\alpha = a^2$ c. $x^2+y^2-2xy\tan 2\alpha = a^2$

b. $x^2-y^2+2xy\tan 2\alpha = a^2$ d. $x^2-y^2+2xyxot2x=a^2$

17. A line cuts x axis at A (7,0), y axis at B (0,-5). A variable line PQ is drawn perpendicular to AB cutting x,y axis at P and Q. If AQ, BP intersect in R, then locus of R is [ ]

a. $x^2+y^2+7x-5y=0$ c. $x^2+y^2-3x+4y=0$

b. $x^2+y^2-7x+5y=0$ d. $x^2+y^2+6x+7y=0$

18. If x= sin1, y= sin2, Z= sin3 then [ ]

a. x < y < z b. x > y > z c. y < z < x d. z < x < y

19. If $\pi < \theta < \frac{3\pi}{2}$ then $\sqrt{\frac{1-\cos\theta}{1+\cos\theta}} + \sqrt{\frac{1+\cos\theta}{1-\cos\theta}} =$ [ ]

a. -2 cosecθ b. 2 cosecθ c. -2cotθ d. 2 cotθ

20. If x= a $\sec^n\theta$; y= b $\tan^n\theta$ then $\left(\frac{x}{a}\right)^{2/n} - \left(\frac{y}{b}\right)^{2/n} =$ [ ]

a. 0 b. -1 c. 1 d. 2

Physics

21. A hunter aims his gun and fires a bullet directly at a monkey on a tree. At the instant the bullet leaves the gun, the monkey drops. The bullet [ ]

a. cannot hit the monkey

b. may hit the monkey if its weight is more than 30 kg.wt

c. may hit the monkey if its weight is less than 30 kg.wt

d. hits the monkey irrespective of its weight.

22. The number of bullets are fired horizontally with different velocities from the top of a tower they reach the ground [ ]

a. at same time with same velocity b. at different times with different velocities

c. at same time with different velocities d. at different times with same velocity

23. A and B are two trains moving parallel to each other. If a ball is thrown vertically up from the train A, the path of the ball is [ ]

a. parabola for an observer standing on the ground

b. vertical straight line for an observer in B when B is moving with the same speed in the same direction of A

c. a parabola for an observer in B when B is moving with same speed but in opposite direction

d. all the above are true

24. If the horizontal velocity of a projectile is $\sqrt{\frac{2}{5}}$ times the velocity at half the maximum height, the angle of projection is [ ]

a. 60° b. 30° c. 45° d. none of the above

25. A ball is projected obliquely with a velocity 49ms^{-1} strikes the ground at a distance of 245m from the point of projection. It remained in air for [ ]

a. 10 sec b. $5\sqrt{2}$ sec c. 3sec d. 2.5sec

26. A particle is projected with velocity $2\sqrt{gh}$ and at an angle 60° to the horizontal so that it just clears two walls of equal height h which are a distance 2 h from each other. The time interval for which the particle travels between this two walls is [ ]

a. $2\sqrt{\frac{h}{g}}$ b. $\sqrt{\frac{h}{g}}$ c. $\sqrt{\frac{2h}{g}}$ d. $\sqrt{\frac{h}{2g}}$

27. A stone is thrown horizontally with velocity g ms^{-1} from the top of a tower of height g metre. The velocity with which it hits the ground is (in ms^{-1}) [ ]

a. g b. 2g c. $\sqrt{3}$ g d. 4g

28. Two thin wood screens A and B are separated by 200m. A bullet travelling horizontally at a speed of 600ms^{-1} hits the screen A, penetrates through it and finally emerges out from B making holes in A and B.If the resistance of air and wood are negligible, the difference of heights of the holes in A and B

a. 5 m b. $\frac{49}{90}m$ c. $\frac{7}{\sqrt{90}}m$ d. zero [ ]

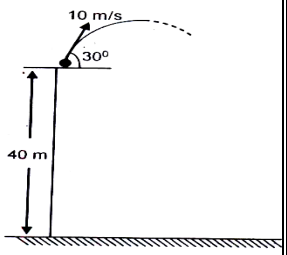
29. A fighter plane flying horizontally at an altitude of 2 km with speed of 540 kmph passes directly over head an antiaircraft gun. If the gun can fire a bullet at the muzzle speed of 500 ms^{-1}, at what angle with the vertical the gun should fire the bullet so that the bullet hits the plane ? [ ]

a. $Cos^{-1}(3/10)$ b. $Sin^{-1}(3/10)$ c. $\tan^{-1}(10/3)$ d. 45°

30. At a certain height a shell at rest explodes into two equal fragments. One of the fragments receives a horizontal velocity u. The time interval after which, the velocity vectors will be inclined at 120° to each other is [ ]

a. $\frac{u}{\sqrt{3}g}$ b. $\frac{\sqrt{3}u}{g}$ c. $\frac{2u}{\sqrt{3}g}$ d. $\frac{u}{2\sqrt{3}g}$

31. A particle is projected from a height of 40 m as shown in figure Determine the instant at which the particle's direction of motion makes an angle of 45^0 with the horizontal ? Take = $10m/s^2$.[ ]

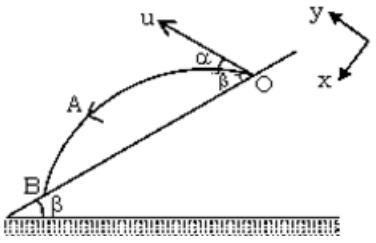


a. $\frac{\sqrt{3}-1}{2}s$ b. $\left(\sqrt{3}+1\right)s$ c. $\frac{\sqrt{3}+1}{2}s$ d. not possible

32. The maximum distance to which a man can throw a ball by projecting it horizontally from a height h is h. The maximum distance to which he can throw it vertically up is [ ]

a. h b. 2h c. h/2 d. h/4

33. As shown in the above figure a body is projected down the plane, then U_x and U_y are [ ]



a. $u\cos(\alpha+\beta)$ $u\sin(\alpha+\beta)$ b. $u\cos(\alpha-\beta)$ $u\cos(\alpha-\beta)$

c. $u\cos(\alpha\beta)$ $u\sin(\alpha+\beta)$ d. $u\cos(\beta-\alpha)$ $u\cos(\alpha+\beta)$

34. The equation of trajectory of a projectile is $y = 10x - \left(\frac{5}{9}\right)x^2$. If we assume g = $10ms^{-2}$ the range of projectile (in meters) is [ ]

a. 36 b. 24 c. 18 d. 9

35. Two particles are projected with same velocity but at angles of projection (45-θ) and (45+θ). Then their horizontal ranges are in the ratio of [ ]

a. 1 : 2 b. 2 : 1 c. 1 : 1 d. none of the above

Chemistry

36. A quantity of heat is confined in a chamber of constant volume, when the chamber is immersed in bath of melting ice, the pressure of the gas is 1000 torr. Final temperature when the pressure manometer indicates an absolute pressure of 400 torr. [ ]

a. 273 b. 373 k c. 109 k d 90k

37. The density of Neon will be highest at [ ]

b. STP b. 0°C, 2 atm c. 273° C, 1 atm d. 273°C, 2atm

38. The rate of diffusion of methane at a given temperature is twice that of gas X. The molecular weight of X is [ ]

c. 64 b. 32 c. 4 d. 8

39. A 10 cm gas column is trapped by a column of Hg of 4 cm long in capillary tube of uniform bore. The tube is held horizontally in a room at 1 atm length of the air column when the tube is held vertically with open end up is [ ]

a. 3.5 cm b. 9.95 cm c. 6.2 cm d. 4.8 cm

40. What will be molar volume of Nitrogen and Argon at 273.15K and 1atm [ ]

a. 11.2, 22.4 respectively b. 22.4, 22.4 respectively

c. 11.2, 11.2 respectively d. 22.4, 11.2 respectivly

41. An open vessel at 27°C is heated until $3/8^{th}$ of air in it has been expelled. Assuming that the volume remains constant, calculate the temperature at which the vessel was heated [ ]

a. 307°C b. 107°C c. 480°C d, 207°C

42. A manometer is connected to a gas containing bulb the open arm reads 40.0 cm. Where as the arm connected to the bulb reads 15.0cm. If the barometric pressure is 74.0 cm of Hg, then what is the pressure of the gas in bars [ ]

a. 1.319 b. 99 c. 0.913 d. 1.214

43. Which of the following order is correct for acidic strength [ ]

a. $So_2 < P_2O_3 < SiO_2 < Al_2O_3$ b. $SiO_2 < SO_2 < Al_2O_3 < P_2O_3$

c. $Al_2O_3 < SiO_2 < SO_2 < P_2O_3$ d. $Al_2O_3 < SiO_2 < P_2O_3 < So_2$

44. The radius of La^{+3} (z = 57) is 1.06 A°. Which one of the following given values will be closest to the radius of Lu^{+3} (z = 71) [ ]

a. 1.60 A° b. 1.40 A° c. 1.06 A° d. 0.85 A°

45. The correct ionic radii order [ ]

a. $La^{+3} < Ce^{+3} < Pm^{+3} < yb^{+3}$ b. $yb^{+3} < pm^{+3} < Ce^{+3} < La^{+3}$

c $La^{+3} = Ce^{+3} < pm^{+3} < yb^{+3}$ d. $yb^{+3} < pm^{+3} < La^{+3} < Ce^{+3}$

46. The formation of the oxide on $O^{-2}_{(g)}$ requires first an exothermic and then an endothermic step as shown below [ ]

$O_{(g)} + e^- \rightarrow O^-_{(g)}$ $\Delta H^0 = -142\ kJmol^{-1}$

$O^{-2}_{(g)} + e^- \rightarrow O^{-2}_{(g)}$ $\Delta H^0 = 844\ kJmol^{-1}$

a. Oxygen is mole electronegative b. oxygen has high electron affinity

c. O^- ion will tend resist the addition of another electron

d. O^- ion has comparatively larger size than oxygen atom

47. Consider N^{-3}, O^{-2}, F^-, Na^+, Mg^{+2} and Al^{+3} ions what is common in then [ ]

a. Number of electrons b. Number of valence electrons

c. Number of protons d. All the above

48. The correct IP order is [ ]

a. P < S < O < N b. S < P < O < N

c. S < O < P < N d. P < S<N < O

49. Which pair of atomic numbers belongs to S – blocks [ ]

a. 3, 12 b. 6, 12 c. 7, 15 d. 9, 17

50. Be resembles much with [ ]

a. Li b. Al c. Zn d. Ra