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Class: 9-CO, F1   FACT TEST   Marks : 100M
Subject:MATHS, PHYSICS, CHEMISTRY   Time: 2 ½ hrs
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Name of the Student: _____   Sec:_____   G.C.S. ._____

I.   Choose the correct answer   50x2=100M

1. $\frac{d}{dx}\left\{ Log\left|Secx+Tanx\right|\right\}$ = _____   [   ]

a. Secx + Tanx   b. Secx   c. Tanx   d. Secx – Tanx

2.   If $x^y + y^z = a^b$ then $\frac{dy}{dx}$ = _____   [   ]

a. $-\left[\dfrac{yx^{y-1} + y^x Logy}{x^y Logx + xy^{x-1}}\right]$ b $\left[\dfrac{yx^{y-1} + y^x Logy}{x^y Logx + x.y^{y-1}}\right]$ c. xy   d. $\dfrac{x}{y}$

3.   The equation of the Tangent to $4x^2 – 9y^2 = 36$ which is perpendicular to x+2y = 20 is ____   [   ]

a. $2x – y = \pm 4\sqrt{2}$ b. $2x-y = 4\sqrt{2}$ c. 2x-y = 4   d. 2x + y = 4

4.   If the curves $x = y^2$ and xy = k cut orthogonally then K^2 = _____   [   ]

a. $\dfrac{1}{2}$ b. $\dfrac{1}{4}$ c. $\dfrac{1}{8}$ d $\dfrac{1}{16}$

5.   f(x) = $x^{1/x}$ is increasing when _____   [   ]

a. x > e   b. x < e   c. –e < x < e   d. O < x < e

6.   f(x) = $Tan^{-1}x – x$ is decreasing in   [   ]

a. $\left(-\infty,\infty\right)$ b. (0, ∞) only   c. (-1, 1) only   d. (-∞ , 0) only

7.   The middle term in the expansion of $(1-3x + 3x^2 – x^3)^{2n}$ is _____   [   ]

a. $^{6n}C_{3n}$ (-x)^{3n} b. $^{6n}C_{2n}$ (-x)$^{2n+1}$ c. $^{4n}C_{3n}$ (-x)^{3n} d. $^{6n}C_{3n}$ (-x)$^{3n-1}$

8.   If the 5th term is the term independent of 'x' in the expansion of $(x^{2/3}+\frac{1}{x})^n$ then n = _____   [   ]

a. 10   b. 8   c. 7   d. 12

9.   Coefficient of x^5 in $(1+x+x^2 +x^3)^{10}$ is _____   [   ]

a. 1910   b. 1902   c. 1819   d. 1932

10.   The greatest integer which divides the number 101^{100}-1 is _____   [   ]

a. 10^2 b. 10^3 c. 10^4 d. 10^5

11.   In $(1+x)^{50}$, $C_1 + C_3 + C_5 + C_7 + ...$ =   [   ]

a. 2^{50} b. 2^{49} c. 2^{48} d. 2^{46}

12.   The coefficient of x^{-17} in $\left(x^4 - \dfrac{1}{x^3} \right)^{15}$ is _____   [   ]

a. -1365   b. 1365   c. 465   d. – 465

13.   Let n be a positive integer. If the Coefficients of 2nd , 3rd and 4Th terms in $(1+x)^n$ are in AP then n = -----[   ]

a. 5   b. 6   c. 7   d. 8

14. No of distinct terms in $(x+y+z)^{25}$ is _____   [   ]

a. $^{27}C_2$ b. $^{27}C_3$ c. $^{28}C_2$ d. None

15. $^{6}C_5 + \sum_{J=1}^{5} \ ^{11-J}C_4$ = -----------   [   ]

a. $^{6}C_5$ b. $^{11}C_4$ c. $^{11}C_5$ d. $^{12}C_5$

16. The expression $\left[x + \left(x^3 - 1 \right)^{1/2} \right]^5 + \left[x - \left(x^3 - 1 \right)^{1/2} \right]^5$ is a polynomial of degree _____   [   ]

a. 7   b. 4   c. 5   d. 6

17. IF n is a positive integer then $2^{4n} - 15n - 1$ is divisible by _____   [   ]

a. 64   b. 196   c. 225   d. 256

18. If R = $(6\sqrt{6} + 14)^{2n+1}$ and f = R-[R]. Where [.] denotes the G.I.F then Rf = _____   [   ]

a. 20^n b. 20^{2n} c. 20^{2n+1} d. 1

19. The number of integral terms in the expansion of $\left(\sqrt{3} + \sqrt[4]{5} \right)^{200}$ is _____   [   ]

a. 49   b. 50   c. 52   d. 51

20. $1\ C_0 + 3C_1 + 3^2\ C_2 + 3^3\ C_3 + \ldots \ldots 3^n\ C_n$ = _____   [   ]

a. 4^n b. 3^n c. 2^n d. None

Physics

21. Equal masses of two substances whose densities are 0.3 g/c.c and 0.9 g/c.c are mixed homogeneously. Find the density of mixture?   [   ]

a. 0.35   b. 0.45   c. 0.55   d. 0.85

22. A cube of side 10cm floats in a fluid of density 1.5 g/cc. Find the density of the cube if 3cm of its length is inside the fluid.   [   ]

a. 0.45 gm/cc   b. 0.35 g/cc   c. 0.25 g/cc   d. 0.15 g/cc

23. Find the fraction of the volume of a body outside the water when it is immersed in water. The density of the body is 0.2 g/cc   [   ]

a. 2/3   b. 4/3   c. 4/5   d. 2/5

24. A stone weight 80 gm in air, 50 gm in a liquid and 30 gm in water. Find the relative density of liquid

a. 0.4   b. 0.8   c. 0.9   d. 0.6   [   ]

25. What is the area of the smallest block of ice 0.5m thick that will just support a man of mass 100kg? The block of ice is floating fresh water. (S.G of ice = 0.9)   [   ]

a. $2m^2$ b. $4\ m^2$ c. $10\ m^2$ d. $0.25\ m^2$

26. If his the height of the liquid in a closed tank d is its density 'g' is acceleration due to gravity. Find the pressure at the bottom of a tank   [   ]

a. Po + hdg   b. P_0 – hdg   c. p_0 d. hdg

27. If mercury (density = 13.6 g/cc) height in a glass tube is 50 cm. Find the pressure   [   ]

a. 6.8×10^4 pa   b. 6.8×10^3 pa   c. 6.8×10^2 pa   d. 6.8×10^1 pa

28. Two liquids when they are mixed in equal volumes resultant density is 9. When they are mixed equal

masses resultant density is 8 find the density of liquids   [   ]

a. 12, 6   b. 10 , 5   c. 9, 6   d. 8, 4

29. A block of wood weighing 80 N and of specific gravity 0.8 is tied by string to the bottom of a tank of

water in order to have the block totally immersed what is the tension in the string?   [   ]

a. 10N   b. 20N   c. 100N   d. 50N

30. In a Bramah press a force 10 kg wt is applied on a piston of area of cross section $5cm^2$ then the upward

thrust exerted by the piston of area of cross – section 50 cm^2 is   [   ]

a. 100 kg wt   b. 200 kg wt   c. 300 kg wt   d. 400 kg wt

31. A block can slide on a smooth inclined plane of inclination 'θ' kept on the floor of a lift when the lift is

descending with retardation a, the acceleration of the block is   [   ]

a. (g+a) sin θ b. g – a   c. g sin θ d. (g-a) sin θ

32. Equal mass of three liquids are kept in three identical cylindrical vessels A, B and C. The densities are dA, dB and

dC with $d_A < d_B < d_C$. The force on the base will be   [   ]

a. maximum invessel A   b. maximum in vessel B

c. maximum in vessels C   d. equal in all the vessels

33. A hydraulic automobile lift is designed to lift cars with a maximum load of 1000N. The area of cross section of

the piston carrying the load is $20cm^2$. What maximum pressure would the smaller piston have to bear [   ]

a. 6.92 atm   b. 5 atm   c. 4 atm   d. 2 atm

34. A mercury barometer reads 75 cm. If the tube be inclined by 60° from vertical. The height of mercury in the

tube will be   [   ]

a. 37.5   b. 150 cm   c. $\dfrac{75\sqrt{3}}{2}$ cm   d. 100 cm

35. Find the fraction of the volume of a body inside the water when it is immersed in water. The relative density of

the body is 0.6   [   ]

a. $\dfrac{3}{5}$ b. $\dfrac{2}{5}$ c.4/5   d. 7/5

Chemistry

36. The law of octaves was developed by   [   ]

a. Newlands   b. Mendeleef   c. Lother mayer   d. Dobereiner

37. Among s-block metals and transition metals which are more metallic   [   ]

a. s- block metals   b. Transition metals   c. both are equally metallic   d. cannot be Predicted

38. The highest oxidation state is shown by   [   ]

a. Ru, Os   b. Fe, Os   c. W, Os   d. Re, Mo

39. Atomic Radius depends upon　　　　　　　　　　　　　　　　　　　　　　　[　　]
   a. No. of bonds formed by the atom　　　　b. Nature of bonding
   c. Oxidation state of the atom　　　　　　　d. All the above

40. Pair of ions with similar ionic radii　　　　　　　　　　　　　　　　　[　　]
   a. Li^+, Mg^{+2}　　　　b. Li^+, Na^+　　　　c. Mg^{+2}, Ca^{+2}　　　d. Mg^{+2}, K^+

41. The element with the highest electron affinity is　　　　　　　　　　[　　]
   a. He　　　　　b. Li　　　　　c. Be　　　d. B

42. Ionisation energy of Mg to Mg^{+2} is 22.67 e.v/atm. If the first Ionisation energy is 738kJ/Mol, the second Ionisation energy of Magnesium in (KJ/Mole)　　　　　　　[　　]
   a. 1448　　　　b. 1702　　　　c. 738　　　　d. 1476

43. If Ionisation energy of fluorine is 320 kJ/mole then the electron affinity of fluorine will be[　　]
   a. -320 k.J/mole　　　　b. -160 k.J / mole　　　c. 320 k.J/mole　　　d. 160 k.J/mole

44. The electronegativity values according to Mulliken scale are _____ times the values in Pauling scale
   a. 0.208　　　　b. 2　　　　c. 2.8　　　　d. 544　　　　[　　]

45. The Ionisation energy and electron affinity of an element are 13.0 ev and 3.8 ev respectively its electronegativity is　　　　　　　　　　　　　　　　　[　　]
   a. 2.8　　　　b. 3.0　　　　c. 3.5　　　　d. 4.0

46. The most electropositive element is　　　　　　　　　　　　　　　[　　]
   a. I　　　　　b. Mg　　　　　c. Cs　　　　d. Li

47. Least acidic among the following is　　　　　　　　　　　　　　　[　　]
   a. SiO_2　　　　b. Co_2　　　　c. P_4O_{10}　　　　d. N_2O_5

48. Aluminium is diagonally related to　　　　　　　　　　　　　　　[　　]
   a. Li　　　　　b. Be　　　　　c. C　　　　d. B

49. A metal forms a chloride with the formula MCl_2 Formula of Phosphoric acid is H_3PO_4. Formula of the phosphate of the metal is　　　　　　　　　　　　　[　　]
   a. M_3PO_4　　　　b. MPo_4　　　　c. $M_3(PO_4)_2$.　　　　d. M_2PO_4

50. IP_1 value of chlorine is 12eV and electron affinity of chlorine is 3.6 eV number of chlorine atoms in the gaseous state that can be ionised by utilising the energy that is liberated in the Process $Cl_{(g)}+e^- \rightarrow Cl^-_{(g)}$ involving one mole of chlorine atoms is　　　　　　　　　　　　　[　　]
   a. 1.3×10^{23}　　　　b. 3　　　　c. 3×10^{23}　　　　d. 1.8×10^{22}