DR K.K.R'S GOWTHAM(E.M) SCHOOL

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 20x1=20M

1. $\underset{x\to 0}{Lt}\ \frac{Sin3x\ \ Tan4x}{x\ Sin\ 5x}$ = [ ]

a.1 b. $\frac{5}{12}$ c.0 d. $\frac{12}{5}$

2. If α , β are the roots of ax²+bx+c =0 then $\underset{x\to\alpha}{Lt}\ \frac{1-Cos(ax^2+bx+c)}{(x-\alpha)^2}$ [ ]

a. 0 b. $\frac{(\alpha-\beta)^2}{2}$ c. $\frac{a^2}{2}(\alpha-\beta)^2$ d. $-\frac{a^2}{2}(\alpha-\beta)^2$

3. If f(x) = $\frac{1-Cos(1-\cos x)}{x^4}$ is continuous at x = 0 then f(0) = _____ [ ]

a. $\frac{1}{2}$ b. $\frac{1}{4}$ c. $\frac{1}{6}$ d. $\frac{1}{8}$

4. If xy = x+y then $\frac{dy}{dx}$ = _____ [ ]

a. $\frac{xy}{1-x}$ b. $\frac{y+1}{1-x}$ c. $\frac{y}{1-xy}$ d. $\frac{-1}{(x-1)^2}$

5. If y = x + $\frac{1}{x+\frac{1}{x.....\infty}}$ then $\frac{dy}{dx}$ = [ ]

a. $\frac{y}{2y-x}$ b. $\frac{y}{x+2y}$ c. $\frac{y}{x-2y}$ d. y

6. If y = $e^{\sin^{-i}x}$, then (1-x²) $y_2 - xy_1$ [ ]

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

7. A {-1, 0, 1, 2} B = {2, 3, 6}. If f from A into B defined by f(x) = x² + 2 then f is [ ]

a. a function b. one-one c. onto d. one one onto

8. If f(x) is a function such that f(x+y) = f(x) f(y) and f(3) = 125 then f(x) = [ ]

a. 5 b. x^5 c. 5^x d. 5x

9. The domain of f(x) = $\sqrt{(x-1)(x+1)(x+2)}$ is _____ [ ]

a. (-2, -1) $\cup(1,\infty)$ b. [-2, -1] $\cup[1,\infty)$ c. [-2, -1] d. $(1,\infty)$

10. The range of 5 sinx + 12 cos x – 13 is _____ [ ]

a. [0, 13] b. [-13, 0] c. [-26, -13] d. [-26, 0]

11. Let f be areal – valued invertible function such that $f\left(\frac{2x-3}{x-2}\right)$ = 5x-2, x ≠ 2 then the value of $f^{-1}(13)$ is

a. 2 b. 3 c. $\frac{1}{3}$ d. none

12. The equation of the tangent to the curve 6y = 7-x³ at (1,1) is _____ [ ]

a. 2x+y-3=0 b. x+2y-3=0 c. x+y-1=0 d. x+y+2=0

13. If the Area of the triangle formed by a tangent to the curve $x^n y = a^{n+1}$ and the coordinate axes is constant, then n = _____ [ ]

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

14. If the curves ay+x²=7 and x^3 = y intersect orthogonally at (1,1) then the value of a = _____ [ ]

a. 3 b. 6 c. $\frac{1}{6}$ d. none

15. The angle between the curves x³-3xy² = 2 and 3x²y – y³ = 2 is _____ [ ]

a. $\frac{\pi}{6}$ b. $\frac{\pi}{3}$ c. $-\frac{\pi}{3}$ d. $\frac{\pi}{2}$

16. If the function f(x) = x^x decreases on the interval [ ]

a. (0,e) b. (0,1) c. $(0, \frac{1}{e})$ d. $(-\frac{1}{e}, 0)$

17. If the function f(x) = x³ -ax²+48x+7 is increasing then 'a' lies between _____ [ ]

a. ± 12 b. 4, 8 c. ± 8 d. ± 6

18. Stationary point of y = x²+$\frac{250}{x}$ is _____ [ ]

a. (1, 51) b. (5, 1) c. 5, 25) d. (5, 75)

19. $\lim_{x\to 4} \frac{x^3-4x^2-x+4}{x^2-3x-4}$ = _____ [ ]

a. 4 b. 3 c. -4 d. -3

20. $\lim_{n\to\infty} \frac{1^2+2^2+3^2+.....+n^2}{n^3}$ = _____ [ ]

a. 1 b. $\frac{1}{2}$ c. $\frac{1}{3}$ d. $\frac{1}{4}$

PHYSICS

21. The refractive index of glass and water respect to air are 3/2 and 4/3 respectively. The refractive index of glass with respect to water is ……. [ ]

a. 8/9 b. 9/8 c. 1/12 d. 2

22. A ray of light incident on a refracting surface at 30° with the surface. If the angle of refraction is 45°. Refractive index of the medium is [ ]

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

23. A ray of light is incident on the surface of a medium at an angle 45° and is refracted in the medium at an angle 30^0. What is the velocity of light in the medium? [ ]

a. 1.96×10^8 ms^{-1} b. 2.12×10^8 ms^{-1} c. 3.18×10^8 ms^{-1} d. 3.33×10^8 ms^{-1}

24. A fish 40 cm beneath the surface of a pond seas a bird directly over head. If the bird is actually 15 cm above the water surface the same appears to be seen by the fish. Above the water surface is $(\mu = 4/3)$ [ ]

a. 10 cm b. 20 cm c. 25 cm d. 30 cm

25. A rupee coin lies at the bottom of a beaker which contains water upto a height of 8cm. The apparent depth of the coin is $\left(\mu_w = \frac{4}{3}\right)$ [ ]

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

26. There is a fish at a depth of 1m in clear water of refractive index 4/3. The fish sees the water surface of a mirror except a circular patch. The radius of the patch is [ ]

a. $\frac{1}{\sqrt{7}}$ m b. $\frac{3}{\sqrt{7}}$ m c. $\frac{6}{\sqrt{7}}$ m d. $\frac{9}{\sqrt{7}}$ m

27. A glass cube of edge 1 cm and μ = 1.5 has a small spot at the centre. The area of the cube face that must be covered to prevent the spot from being seen is [ ]

a. $\frac{\pi}{5}$ cm^2 b. 5π cm^2 c. - $\frac{\pi}{5}$ cm^2 d. $\sqrt{5}\pi$ cm^2

28. The temperature of a patient is 40°C. his temperature on Farenheit scale will be [ ]

a. 104^0 F b. 72° F c. 96°F d. 100^0 F

29. The temperature difference of 25°C is equivalent to a temperature difference of [ ]

a. 25° F b. 45° F c. 67° F d. 77°F

30. A faulty thermometer 5°C in melting ice and 99°C in steam. Find the correct temperature in °F when this faulty thermometer reads 52° C [ ]

a. 122 °F b. 140° F c. 160° F d. 180°F

31. An amount of water of mass 20 gms at 0°C is mixed with 40 gms of water at 10°.Final temperature of mixture is

a. 20° c b. 6.66 °C c. 5 ° C d. 0° C [ ]

32. 5 g ice at 0° C is mixed with 5 g of steam at 100°c what is the final temperature [ ]

a. 0°C b. 50° C c. 75° C d. 100° C

33. n number of liquids of masses m, 2m, 3m…… having specific heats s, 2s, 3s, 4s,…….are at temperatures t, 2t, 3t, 4t…… are mixed. The resultant temperatures [ ]

a. $\frac{3nt}{2n+1}$ b. $\frac{2n(n+1)t}{3(2n+1)}$ c. $\frac{3n(n+1)t}{2(2n+1)}$ d. $\frac{3n(n+1)t}{(2n+1)}$

34. There are two brass spheres at the same temperature. If their radii are in the ratio 2 : 3. The ratio of their thermal capacities is [ ]

a. 4 : 9 b. 2 : 3 c. 8 : 27 d. 27 : 8

35. 0.2 kg ball falls from a height of 30 m and bounces of 9m. If all the K.E lost is converted to heat and is absorbed by the ball rise in its temperature in °C is (sp. Heat of steel = 0.1 cal/gm°C and g = 10 ms^{-2}) [ ]

a. 5 b. 0.5 c. 2 d. 0.2

CHEMISTRY

36. Electrophiles are [ ]

a. Lewis acids b. Lewis bases c. Bronsted acids d. Bronsted Bases

37. The conjugate acid of NH^-_2 is [ ]

a. NH_3 b. NH_2OH c. NH_4^+ d. N_2H_2

38. The oxy acid of SO_2 is [ ]

a. H_2SO_3 b. H_2SO_4 c. $H_2S_2O_8$ d. None

39. The strength of an Acid depends on its [ ]

a. Acidity b. Bascity c. Degree of Ionisation d. Molecular weight

40. H_3BO_3 is _____ Acid [ ]

a. Mono basic b. dibasic c. tribasic d. none

41. PK_a values of four acids are given below at 25°C. Indicate the strongest Acid [ ]

a. 2.0 b. 2.5 c. 3.0 d. 4.0

42. Which acts as a Lewis Acid [ ]

a. cl^- b. BF_3 c. H_2O d. NH_3

43. Ionic product of water increases if [ ]

a. pressure is reduced b. H^+ ion is added c. OH^- is added d. Temperature is increased

44. An aqueous solution whose $p^H = 0$ [ ]

a. Acidic b. Basic c. Neutral d. Amphoteric

45. The OH^- ion concentration of a weak base is [ ]

a. c. K_b b. $\sqrt{c.k_b}$ c. $\sqrt{k_b / c}$ d. $\sqrt{k_b}$

46. Which of the following is correct for Buffer [ ]

a. $pk_a = p^H + \log \frac{[S]}{[A]}$ b. $p^H = pK_a + \log \frac{[S]}{[A]}$ c. $[H^+] = 10^{-PK_a}$ d. $p^H = -\log \frac{[S]}{[A]}$

47. The p^H of a solution is increased from '3' to '6' . Its H^+ ion concentration will be [ ]

a. Reduced to half b. doubled c. Reduced by 1000 times d. Increased by 1000 times

48. An Acidic Buffer contains 0.06 M salt and 0.02 M acid. The dissociation constant of acid is 10^{-4}. The pH of the Buffer solution is [ ]

a. 4 b. 10 c. 4.48 d. 9.52

49. The pH of 10^{-10} M NaoH solution is nearest to [ ]

a. 10 b. 7 c. 4 d. -10

50. 0.2 M solution of formic acid is 3.2% ionised. Its ionisation constant is [ ]

a. $9.6x10^{-3}$ b. 2.1×10^{-4} c. 1.25×10^{-6} d. 4.8×10^{-5}