ST.XAVIER'S CATHOLIC COLLEGE OF ENGINEERING
CHUNKANKADAI, NAGERCOIL
St.Xavier's Merit Scholarship Exam – SAMPLE QUESTION PAPER

A

Time: 90 minutes   Total=75 marks

Answer All the Questions (75x1=75)

1. Choose the appropriate opposite for the word expressed in italics:

    The book *attracted* little attention when it was published

    a) distracted   b) repelled

    c) infamous   d) unpopular

2. Choose the correct verb and fill in the blanks with the suitable tense form.

    In this way, tradition _____ itself for providing a testing ground for the new.

    a) protect   b) cling

    c) allow   d) involve

3. The following sentence contains an idiom. From the given options choose the expression as the meaning of the idiom.

    Both our professors have the <u>gift of the gab.</u>

    a) They are gifted   b) They are talkative

    c) They are good conversationalists   d) They have good understanding

4. Fill in the blanks with appropriate homophones.

    Education plays an important _____ in man's life.

    a) role   b) roll

    c) rule   d) row

5. Fill in the blanks using the correct linking words.

    _____ heavy rainfall, there was no power cut.

    a) Due to   b) In spite of

    c) Even though   d) Because of

6. Pick out the right answer:

President

a) monosyllabic word   b) disyllabic word   c) trisyllabic word   d)   tetrasyllabic word

7. Fill in the blanks with the right phrasal verb:

The fire _____ in the kitchen.

a) broke out   b) broke off   c) break up   d) break in

8. Pick the right compound word for the given pattern:

Noun + Noun

a) schoolgirl   b) sunrise   c) playground   d) whitewash

9. Pick out the right expansion for the Abbreviation given below:

BBC

a) Basics of Business Communication

b) British Broadcasting Corporation news

c) Bachelor of Business Communication

d) British Broadcasting Consultant

10. Fill in the blanks with the correct answer:

English_____ (speak) all over the world by millions of people

a) will have been spoken   b) is spoken   c) was spoken   d) will be spoken

11. If the rank of the matrix $\begin{bmatrix} \lambda & -1 & 0 \\ 0 & \lambda & -1 \\ -1 & 0 & \lambda \end{bmatrix}$ is 2, then λ is

a)   1   b) 2

c)   3   d) any real number

12. If $x^2 + y^2 = 1$ then the value of $\dfrac{1+x+iy}{1+x-iy}$ is

a) x-iy   b) 2x

c) -2iy   d) x+iy

13. The value of $i + i^{22} + i^{23} + i^{24} + i^{25}$ is

    a) i

    b) –i

    c) 1

    d) -1

14. The Polar form of the complex number $\left(i^{25}\right)^3$ is

    a) $\cos\dfrac{\pi}{2} + i\sin\dfrac{\pi}{2}$

    b) $\cos\pi + i\sin\pi$

    c) $\cos\pi - i\sin\pi$

    d) $\cos\dfrac{\pi}{2} - i\sin\dfrac{\pi}{2}$

2.

15. The eccentricity of the hyperbola $12y^2 - 4x^2 - 24x + 48y - 127 = 0$ is

    a) 4

    b) 3

    c) 2

    d) 6

16. If $y = (1-x)(1+x^2)(1+x^4)\ldots\ldots(1+x^{2n})$ then $\dfrac{dy}{dx}$ at $x=0$ is

    a) -1

    b) $\dfrac{1}{(1+x)^2}$

    c) $\dfrac{x}{1+x^2}$

    d) $\dfrac{x}{(1-x)^2}$

17. The maximum area of a right angled triangle with hypotenuse h is

    a) $\dfrac{h^3}{2\sqrt{2}}$

    b) $\dfrac{h^2}{2}$

    c) $\dfrac{h^2}{\sqrt{2}}$

    d) $\dfrac{h^2}{4}$

18. The area enclosed between the curves $y^2 = x$ and $y = |x|$ is

    a) $\dfrac{2}{3}$ sq.units

    b) 1 sq.units

    c) $\dfrac{1}{6}$ sq.units

    d) $\dfrac{1}{3}$ sq.units

19. The value of $\displaystyle\int_0^1 x(1-x)^4\, dx$ is

    a) $\dfrac{1}{12}$

    b) $\dfrac{1}{30}$

3

c) $\dfrac{1}{24}$

d) $\dfrac{1}{20}$

20. The value of $\displaystyle\int_0^\pi \sin^2 x \cos^3 x\, dx$ is

    a. a) π

                                                                             b) $\dfrac{\pi}{2}$

c) $\dfrac{\pi}{4}$

d) 0

21. If $\cos x$ is an integrating factor of the differential equation $\dfrac{dy}{dx} + Py = Q$ then $P =$

    a) $-\cot x$ b) $\cot x$

    c) $\tan x$ d) $-\tan x$

22. The integrating factor of the differential equation $\dfrac{dy}{dx} + Py = Q$ is

    a) $\displaystyle\int P dx$ b) $\displaystyle\int Q dx$

    c) $e^{\int Q dx}$ d) $e^{\int P dx}$

23. The differential equation obtained by eliminating A and B from the relation $y = e^x(A\cos x + B\sin x)$ is

    a) $y_2 + y_1 = 0$ b) $y_2 - y_1 = 0$

    c) $y_2 - 2y_1 + 2y = 0$ d) $y_2 - 2y_1 - 2y = 0$

24. If a compound statement is made up of three simple statements, then the number of rows in the truth table is

    a) 8   b) 6

    c) 4   d) 2

25. Which of the following is not a group?

    a) $(Z_n, +_n)$ b) $(Z, +)$

    c) $(Z, .)$ d) $(R, +)$

26. If $\dfrac{1-i}{1+i}$ is a root of the equation $ax^2 + bx + 1 = 0$ where a, b are real then (a,b) is

    1) a) $(1,1)$ b) $(1,-1)$ c) $(0,1)$ d) $(1,0)$

27. The asymptotes of the rectangular hyperbola $xy = c^2$ are

    a) $x = c, y = c$ b) $x = 0, y = c$ c) $x = c, y = 0$

    d) $x = 0, y = 0$

28. If $\Delta = \begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix}$ and $A_1, B_1, C_1, \ldots$ are the cofactors of $a_1, b_1, c_1, \ldots$, then $a_1 A_2 + b_1 B_2 + c_1 C_2$

is equal to

    a)   0   b) Δ

    c) $-\Delta$ d) Δ^2

29. If $\overrightarrow{AB} = k \overrightarrow{AC}$, where k is a scalar, then

    a)   A,B,C are collinear   b) A,B,C are coplanar

    c) $\overrightarrow{AB}$ and $\overrightarrow{AC}$ have the same magnitude   d) A,B and C coincide

30. The general term of the binomial expansion of $(x + a)^n$ is

    a) $^nc_r \, x^{n-r} \, a^r$ b) $^nc_r \, x^r \, a^{n-r}$

    c) $^nc_n \, x^{n-r} \, a^r$ d) $^nc_n \, x^n \, a^{n-r}$

31. The length of the tangent from (4,5) to the circle $x^2 + y^2 = 25$ is

    a)   5   b) 4

    c)   25   d) 16

32. The radius of the circle $x^2 + y^2 - 2x + 4y - 20 = 0$ is

    a)   5   b) 2

    c)   3   d) 4

33. The function f(x) = |x| is

    a)   continuous at x=0   b) discontinuous at x=0

    c)   differentiable at x=0   d) both continuous and differentiable

    at x=0

34. The value of $\int 2\log x \, dx$ is

    a) $\dfrac{1}{x} + c$ b) $\dfrac{(\log x)^2}{2} + c$

    c) *2x log x - 2x + c*   d) *x log x – x + c*

35. X speaks the truth in 95% of cases and Y speaks truth in 80% of cases. The percentage of cases, they likely to contradict each other in stating some fact is

    a)   14%   b) 86%

    c)   23%   d) 85.5%

36. Given P(A) = 0.50, P(B) = 0.40 and P(A∩B) =0.20, then P(A/B) =

    a)   0.5   b) 0.4

    c)   0.7   d) 0.1

37. If a,b,c are in A.P then 3^a, 3^b, 3^c are in

    a)   A.P   b) G.P

    c)   H.P   d) A.P and G.P

38. The value of $e^{i\theta} - e^{-i\theta}$ is

    a)   2i sinθ   b) sinθ

    c)   cosθ   d) 2cosθ

39. In the group (G, ·) , where G = {1, -1, i, -i }, order of – i is

    a)   4   b)   1

    c)   0   d)   3

40. If $\vec{a}$ and $\vec{b}$ are two vectors such that $|\vec{a}| = 4$, $|\vec{b}|=3$, and $\vec{a} \cdot \vec{b} = 6$, then the angle between $\vec{a}$ and $\vec{b}$ is

    a)   π/6   b) -π/6

    c)   -π/3   d) π/3

41. If the length of a copper wire has a certain resistance R, then on doubling the length its specific resistance

    a) will be doubled   b) will become $1/4^{th}$

    c) will become 4 times   d) will remain the same.

42. Joule's law of heating is

    a) $H = \dfrac{I^2}{R}t$ b) $H = V^2 Rt$

    c) $H = VIt$ d) $H = IRt$

43. An aircraft having a wingspan of 20.48 m flies due north at a speed of 40 ms^{-1}. If the vertical component of earth's magnetic field at the place is 2×10^{-5} T, Calculate the emf induced between the ends of the wings.

    a) − 0.0164 volt   b) − 0.064 volt

    c) 164 volt   d) 64 volt

44. If the kinetic energy of the moving particle is E, then the de Broglie wavelength is,

    a) $\lambda = \dfrac{h}{\sqrt{2mE}}$ b) $\lambda = \dfrac{h}{\sqrt{2E}}$

3.

    c) $\lambda = \dfrac{h}{2mE}$ d) $\lambda = \dfrac{2h}{\sqrt{2mE}}$

45. The number of electric lines of force originating from a charge of 1μC is

    a) 1.129×10^{11} b) 1.6×10^{-19}

    c) 1.129×10^5 d) 8.85×10^{12}

46. The wavelength of electromagnetic waves produced by Hertz is

    a) 5×10^7 Hz   b) 6 m

    c) 600 cm   d) both b & c

47. Two point charges +4q and +q are placed 30 cm apart. At what point on the line joining them the electric field is zero

a) 15 cm from the charge +q   b) 7.5 cm from the charge +q

c) 10 cm from the charge +q   d) both a & c

48. When the negative feedback is applied to an amplifier of gain 50, the gain after feedback falls to 25. Calculate the feedback ratio.

a) $\beta = 0.02$ b) $\beta = 0.01$

c) $\beta = 0.002$ d) $\beta = 0.0001$

49. If 1 kg of a substance is fully converted into energy, then the energy produced is

(a) $9 \times 10^{16} J$ (b) $9 \times 10^{24} J$ (c) 1 J (d) $3 \times 10^{8} J$

50. Electric field intensity is 400 V m^{-1} at a distance of 2 m from a point charge. It will be 100 V m^{-1} at a distance?

(a) 50 cm   (b) 4 cm   (c) 4 m   (d) 1.5 m

51. Fuse wire composition

a)37% Pb+63%Sn b) 20% Fe+80%Ag   c) 70% Ag+30 %Sn   d) 70% Au+30%Mg

52. When a drop of water is introduced between the glass plate and plano convex lens in Newton's rings system, the ring system

(a) Contracts   (b) expands

(c) Remains same (d) first expands, then contracts

53. If the magnitude of displacement is equal to acceleration, then the time period is,

(a) 1 s (b) π s (c) 2π s (d) 4π s

54. The number of significant digits in 0.0006032 is

(b) 8 (b) 7 (c) 4 (d) 2

55. The distance travelled by a body, falling freely from rest in one, two and three seconds are in the ratio

(c) 1: 2: 3 (b) 1: 3: 5

(d) 1: 4: 9 (d) 9: 4: 1

56. Which substance is known as epsom salt?

a) Magnesium sulphate   b) Magnesium carbonate

c) Magnesium chloride   d) Magnesium phosphate

57. The hybridization in methane is

a) sp^2 b) $sp^3 d$

c) sp^3 d) sp^{2}d

58. Galena is

     a) ore of Pb   b) ore of Al

     c) ore of Cu   d) ore of Fe

59. Which compound of boron is called Inorganic benzene?

     a)Borazine   b) Hydrazine

     c) Nitrazine   d) Citrazine

60. Silver salt used in photography

     a) AgCl   b) AgI

     c) AgF   d) AgBr

61. In the lime kiln the reversible reaction $CaCO_3 \rightleftharpoons CaO + CO_2$ proceeds to completion because of

     a) high temperature   b) CO_2 escapes

     c) O_2 escapes   d) low temperature

62. If 2.0 g of an isotope has a half-life of 7 days, the half-life of 1 g of the sample will be

     a) 7 days   b) 3.5 days

     c) 14 days   d) 10.5 days

63. Arrhenius equation

         a)$k = A\ e^{-1/RT}$ b) $k = A\ e^{-RT/Ea}$

         c) $k = A\ e^{-Ea/RT}$ d) $k = A\ e^{Ea/RT}$

64. If E^0 cell is positive, then the cell reaction is

        a)feasible b)non-spontaneous c)positive d)not feasible

65. Which is the most soluble gas in water?

        a)Ammonia   b) Chlorine   c) Helium   d) Nitrogen

66. Which of the following is abundant in earth crust?

a) C   b) Si   c) Ge   d) Sn

67. Method used for the estimation of nitrogen

     a)Haber   b) Kjeldahl   c) Ostwald   d) Huber

68. Natural rubber is a polymer of

    a)Neoprene   b) Isoprene   c) Polyprene d) Monoprene

69. Blue vitriol

       a) Sodium Sulphate   b) Copper Sulphate

       c) Magnesium Sulphate   d) Ferrous Sulphate

70. Plaster of paris

    a) $CaSO_4. \frac{1}{2} H_2O$ b) $CaSO_4. 2H_2O$ c) $CaSO_4. 7H_2O$ d) $CaSO_4. 4H_2O$

71. Number of States and Union territories in India
    a) 27 and 7   b) 29 and 7
    c)   29 and 9   d) 27 and 9

72. In India, National Youth day is celebrated on
    a) 8th of March   b) 27th of July
    c) 21st of June   d) 12th of January

73. Deodhar Trophy is associated with
    a) Hockey   b) Hand Ball
    c) Cricket   d) Foot Ball

74. Who among the following can dismiss Governor of a state from his office?

  a) State Legislative Assembly   b) Parliament c) President   d) None of them

75. Who is the present Chairman of Indian Space Research Organisation (ISRO) ?

     a) Mylswamy Annadurai   *b) K* Radhakrishnan   *c)* G. Madhavan Nair *d) K.Sivan*