QUESTIONS : 75
DURATION : 90 MINUTES

EACH OF THE FOLLOWING QUESTIONS CARRY 2 MARKS

1. An ammeter of 0-25 A range has a guaranteed accuracy of 1% of full scale reading. The current measured is 5 A. The limiting error is
   (A) 2% (B) 2.5%
   (C) 4% (D) 5%

2. In a CRO which of the following is not a part of electron gun
   (A) Cathode (B) Grid
   (C) Accelerating anode (D) X – Y plates

3. The phenomenon of creep occurs in
   (A) Energy meters (B) Voltmeters
   (C) Ammeters (D) Wattmeters

4. Tesla is a unit of
   (A) φ (B) B
   (C) H (D) Mmf

5. The minimum number of two input NOR gates required to implement the simplified value of the equation $f(w,x,y,z) = \sum m(0,1,2,3,8,9,10,11)$ is
   (A) One (B) Two
   (C) Three (D) Four

6. In an RC phase shift oscillator, the phase shift due to each RC network is
   (A) 180^o (B) 90^o
   (C) 60^o (D) 45^o

7. A transistor in CE mode is in saturation region. Then the collector is almost at
   (A) A potential equal to V_{CC} (B) A potential equal to $0.5V_{CC}$
   (C) A potential equal to $2V_{CC}$ (D) Ground potential

8. The octane rating of petrol commercially available is
   (A) 85 – 95 (B) 95 - 100
   (C) 100 – 110 (D) 110 - 125

9. In a petrol engine, the high voltage for spark plug is in the order of
   (A) 1000 volts (B) 2000 volts
   (C) 11kilovolts (D) 22 Kilovolts

10. The compression ratio of a petrol engine is nearly
   (A) 4:1 (B) 8:1
   (C) 15:1 (D) 20:1

11. In automobiles G.V.W refers to
    (A) Gross vehicle width
    (B) Gross vehicle weight
    (C) Gross vehicle wheelbase
    (D) Gross vehicle wheel track

12. The fuel that detonates easily is
    (A) N – heptanes
    (B) Iso - octane
    (C) Benzene
    (D) Alcohol

13. The calorific value of Diesel is about
    (A) 36.5MJ/kg
    (B) 38.5MJ/kg
    (C) 42.5MJ/kg
    (D) 45.5MJ/kg

14. Medical diagnostic investigations using mainstream instruments involve the following set
    (A) Endoscopy, Electrocardiography, MRI, X-rays
    (B) Biopsy, Blood tests, Antibody tests, Blood pressure measurement
    (C) Brain scans, Cystoscopy, Pap smear, Allergy shots
    (D) Amniocentesis, Autopsy, Thyroid scans, Cholesterol test

15. Which of the following is a group of diseases caused by a virus?
    (A) Smallpox, Chickenpox, Poliomyelitis
    (B) Pneumonia, Mumps, Goiter
    (C) Cholera, Typhoid, Diphtheria
    (D) Plague, Tetanus, Hepatitis

16. The following is the latest enzyme action model
    (A) Working model
    (B) Induced-fit model
    (C) Structural model
    (D) Mathematical model

17. The following is a set of fat-soluble vitamins
    (A) Thiamin, Riboflavin, Niacin
    (B) Vitamin B complex, C
    (C) Vitamin A, D, E, K
    (D) Folate, Vitamin B12, Biotin

18. What is the term used in medical services for additional consultation with another physician?
    (A) Pathology diagnosis
    (B) Quality control
    (C) Second opinion
    (D) First opinion

19. A drug that is not protected by the trademark of a company is called:
    (A) Patented drug
    (B) Generic drug
    (C) Brand name drug
    (D) Psychosomatic drug

20. What does the abbreviation CPR in medicine normally stand for?
    (A) Cardiopulmonary resuscitation
    (B) Computerized patient record
    (C) Code of professional responsibility
    (D) Cost performance report

21. After reaching the yielding stage while testing a mild steel specimen, strain
    (A) Becomes constant
    (B) Starts decreasing
    (C) Increases without any increase in load
    (D) None of the above

22. What is the height of wave which is likely to be generated by a wind of 80 km/hr in a reservoir having a fetch of 50 km
    (A) 0.5m
    (B) 1.0 m
    (C) 2.0 m
    (D) 3.0 m

23. Modulus of rigidity is defined as the ratio of
    (A) Longitudinal stress and longitudinal strain
    (B) Volumetric stress and volumetric strain
    (C) Lateral stress and lateral strain
    (D) Shear stress and shear strain

24. A 20 m chain is divided into
    (A) 50 links
    (B) 100 links
    (C) 150 links
    (D) 175 links

25. For ranging a line, the number of ranging rods required is
    (A) At least two
    (B) At least three
    (C) At least four
    (D) At least five

26. Water absorption in 1st class bricks should not be more than
    (A) 20%
    (B) 15%
    (C) 10%
    (D) 25%

27. The stretcher bond in brick masonry can be used only when the thickness of wall is
    (A) 90 mm
    (B) 180 mm
    (C) 190 mm
    (D) 280 mm

28. The hexadecimal representation for 2's complement of $(- 539)_{10}$ is
    (A) ABE
    (B) DBC
    (C) DE5
    (D) 9E7

29. What will be printed by the following C program?

```
#include <stdio.h>
#define foo(x, y) #x #y
int main()
{
    printf("%s\n", foo(k, l));
    return 0;
}
```

    (A) kl
    (B) k l
    (C) xy
    (D) Compile time error

30. Which of the following pairs of IP addresses could belong to the network having subnet mask 255.255.31.0?
    (A) 172.57.88.62 and 172.56.87.23.2
    (B) 10.35.28.2 and 10.35.29.4
    (C) 191.203.31.87 and 191.234.31.88
    (D) 128.8.129.43 and 128.8.161.55

31. Dynamic linking can cause security concerns because
    (A) Security is dynamic
    (B) The path for searching dynamic libraries is not known till run time.
    (C) Linking is insecure
    (D) Cryptographic procedures are not available for dynamic linking

32. The decimal value 0.5 in IEEE single precision floating point representation has
    (A) Fraction bits of 000 ... 000 and exponent value of 0
    (B) Fraction bits of 000 ... 000 and exponent value of –1
    (C) No exact representation
    (D) Fraction bits of 100 ... 000 and exponent value of 0

33. A COCOMO model is
    (A) Common Cost Model
    (B) Constructive Cost Model
    (C) Complete Cost Model
    (D) Comprehensive Cost model

34. A network on the internet has a subnet mask of 255.255.240.0. What is the maximum number of host it can handle?
    (A) 1024
    (B) 2048
    (C) 4096
    (D) 8196

35. If 750 μA is flowing through 11 kΩ of resistance, what is the voltage drop across the resistor?
    (A) 8.25 V
    (B) 82.5 V
    (C) 14.6 V
    (D) 146 V

36. For producing large values of impulse currents, a number of capacitors are charged in
    (A) Parallel and discharged in series
    (B) Parallel and discharged in parallel
    (C) Series and discharged in series
    (D) Series and discharged in parallel

37. What is the line length if a load of 15000 kW at a power factor 0.8 lagging can be delivered by a 3 phase transmission line having conductors each of resistance 1 Ω per kilometre? The voltage at the receiving end is to be 132kV and the loss is about 5%.
    (A) 40.13km
    (B) 37.18km
    (C) 42.38km
    (D) 35.87km

38. The maximum demand on the power system is 100 MW. If the annual load factor is 40%. Calculate the total energy generated in a year.
(A) 3761 * 10^5 kWh (B) 4174 * 10^5 kWh
(C) 3504 * 10^5 kWh (D) 3500 * 10^5 kWh

39. The governing principle of steam turbines are
(A) Nozzle control governing (B) Throttle governing
(C) Bypass governing (D) All of these

40. Which material is used in the liquid type of fuse?
(A) SF_6 (B) Distilled water
(C) Carbon tetra chloride (D) Mineral oil / transformer oil

41. Thermistor is a transducer. Its temperature coefficient is
(A) Negative (B) Positive
(C) Zero (D) None of these

42. A cascade amplifier stags is equivalent to
(A) A common emitter stage followed by a common base stage
(B) A common base stage followed by an emitter follower
(C) An emitter follower stage followed by a common base stage
(D) A common base stage followed by a common emitter stage

43. The Nyquist sampling frequency (in Hz) of a signal given by $6\times10^4 \sin c^2(400t) * 10^6 \sin c^3(100t)$ is
(A) 200 (B) 300
(C) 500 (D) 1000

44. The gain margin (in dB) of a system a having the loop transfer function $G(s)H(s) = \frac{\sqrt{2}}{s(s+1)}$ is
(A) 0 (B) 3
(C) 6 (D) ∞

45. The noise margin of a TTL gate is about
(A) 0.2 V (B) 0.4 V
(C) 0.6 V (D) 0.8 V

46. A band-limited signal with a maximum frequency of 5 kHz is to be sampled. According to the sampling theorem, the sampling frequency which is not valid is
(A) 5 kHz (B) 12 kHz
(C) 15 kHz (D) 20 kHz

47. LEDs are made out of
(A) Silicon (B) Germanium
(C) Gallium Arsenide (D) Silicon and Germanium

48. Select the correct statement for 8051 hardware
    (A) CPU 8 Bit, PC 16 Bit, DPTR 8 Bit, PSW 16 Bit, SP 16 Bit
    (B) CPU 8 Bit, PC 8 Bit, DPTR 16 Bit, PSW 16 Bit, SP 8 Bit
    (C) CPU 8 Bit, PC 16 Bit, DPTR 8 Bit, PSW 8 Bit, SP 16 Bit
    (D) CPU 8 Bit, PC 16 Bit, DPTR 16 Bit, PSW 8 Bit, SP 8 Bit

49. For display of signal pattern ———— voltage is applied to the horizontal plates of a CRO
    (A) Sinusoidal
    (B) Rectangular
    (C) Sawtooth
    (D) None of the above

50. A galvanometer of resistance G is shunted by a very small resistance S. The resistance of the resulting ammeter is
    (A) GS/(G+S)
    (B) G+S
    (C) G-S
    (D) None of the above

51. If the frequency of electrodynamic power factor meter is doubled then its reading will become
    (A) Twice of the original reading
    (B) Half of the original reading
    (C) Four times of the original reading
    (D) Remains unaffected

52. LVDT which is an instrument for the measurement of displacement, works on the principal of
    (A) Linear inductance
    (B) Non – linear inductance
    (C) Mutual inductance
    (D) Linear capacitance

53. A capacitive pressure sensor has a typical measurement uncertainty of
    (A) One
    (B) Two
    (C) Three
    (D) Four

54. Three resistances of 15 Ω each are connected in delta. The resistances of equivalent star will have a value of
    (A) 15 Ω
    (B) 5 Ω
    (C) 20 Ω
    (D) 45 Ω

55. Two 2 H inductance coils are connected in series and are also magnetically coupled to each other, the coefficient of coupling being 0.1. The total inductance of the combination can be
    (A) 0.4 H
    (B) 3.2 H
    (C) 4.0 H
    (D) 3.6 H

56. Green tea is
    (A) Orthodox tea
    (B) Fermented tea
    (C) Unfermented tea
    (D) Semi-fermented tea

57. Low temperature storage of potatoes results in
    (A) Sweet
    (B) Have more sugar
    (C) Have more starch
    (D) Both A & B

58. Corn syrup is a mixture of
(A) Dextrose and maltose
(B) Dextrose and galactose
(C) Galactose and maltose
(D) Glucose and galactose

59. Principle protein of rice is
(A) Zein
(B) Oryzenin
(C) Glutenin
(D) Lysine

60. Which of the following factor of food is considered as intrinsic factor from food safety point of view
(A) Water activity (a_w)
(B) Relative humidity
(C) Temperature
(D) Vapour pressure

61. Lipid content in flour results
(A) Low flour lipid requires more mixing
(B) More flour lipid requires more mixing
(C) Low flour lipid requires less mixing
(D) Lipid has no effect on dough formation

62. By operating system, the resource management can be done via
(A) Time division multiplexing
(B) Space division multiplexing
(C) Both time and space division multiplexing
(D) None of the above

63. The data transfer in UART is done in
(A) Asynchronous start stop format
(B) Synchronous start stop format
(C) Isochronous format
(D) EBDIC format

64. Consider a simple graph (G) where| E(G)|=30 &| E($\bar{G}$)|=36. What is the V|(G)|?
(A) 6
(B) 11
(C) 12
(D) 10

65. Which phase of compiler generates stream of atoms?
(A) Syntax Analysis
(B) Lexical Analysis
(C) Code Generation
(D) Code Optimization

66. For the 8 bit word 00111001, the check bits stored with it would be 0111. Suppose when the word is read from memory, the check bits are calculated to be 1101. What is the data word that was read from memory?
(A) 10011001
(B) 00011001
(C) 00111000
(D) 11000110

67. The worst case time complexity of AVL tree is better in comparison to binary search tree for
(A) Search and insert operations
(B) Search and delete operations
(C) Insert and delete operations
(D) Search, insert and delete operations

68. The efficient data structure to insert/delete a number in a stored set of numbers is
    (A) Queue
    (B) Linked list
    (C) Doubly linked list
    (D) Binary tree

69. The unit of kinematic viscosity is
    (A) Tesla
    (B) Poise
    (C) Stokes
    (D) None of the above

70. Biot number signifies the ratio of
    (A) Inertia force to viscous force in the fluid
    (B) Convective resistance in the fluid to conductive resistance in the sold
    (C) Conductive resistance in the solid to convective resistance in the fluid
    (D) Buoyancy force to viscous force in the fluid

71. In a screw jack, the effort required to lift the load is given by (where W = Load lifted, α = Helix angle, and φ = Angle of friction.)
    (A) $P = W \tan(\alpha - \varphi)$
    (B) $P = W \tan(\varphi - \alpha)$
    (C) $P = W \tan(\alpha + \varphi)$
    (D) $P = W \tan(\alpha / \varphi)$

72. Force of 150 N moves a body in 5 sec along a straight line according to $x = t^3 - 60t$. What is the mass of the moving body?
    (A) 17.23 kg
    (B) 15.23 kg
    (C) 15 kg
    (D) 5 kg

73. According to work energy principle, a particle of mass m when subjected to unbalanced force system, the work done during displacement by all forces is equal to change in ——— during displacement.
    (A) Gravitational energy
    (B) Kinetic energy
    (C) Mechanical energy
    (D) Potential energy

74. Which stress is induced in cylinder wall due to side thrust of the piston?
    (A) Axial stress
    (B) Circumferential stress
    (C) Longitudinal stress
    (D) Bending stress

75. What is the function of cone pulley drive in lathe machines?
    (A) Change the spindle speed
    (B) Drive the lead screw
    (C) Drive the tail-stock
    (D) All of the above