1. The Constituent Assembly met for the first time on 9th December in which year ?
   A) 1947   B) 1946   C) 1950   D) 1949

2. 'Objective Resolution' drafted and moved by Pandit Jawaharlal Nehru in the Constituent Assembly on
   A) 13 December, 1946   B) 30 January, 1946
   C) 26 January, 1950   D) 3 December, 1950

3. First Delimitation Commission was setup in India on
   A) 1976   B) 1955   C) 1951   D) 1960

4. The Prime Minister's Secretariat was renamed into Prime Minister's Office at the time of
   A) P. V. Narasimha Rao   B) Jawaharlal Nehru
   C) V. P. Singh   D) Morarji Desai

5. Who fixes the number of Judges in the Supreme Court ?
   A) The President   B) The Chief Justice
   C) The Parliament   D) Vice President

6. Malayalam newspaper 'Paschimodayam' published in 1847 by
   A) Maman Mapilla   B) Ramakrishna Pilla
   C) Benjamin Bailey   D) Herman Gundert

7. Kallumala agitation associated with
   A) Dress Code   B) Educational Reform
   C) Political Changes   D) Temple Entry

8. Name the work of K. Damodaran.
   A) Riturnati
   B) Pattabakhi
   C) Adukkalayil ninum Arangathekku
   D) Mathilukalkkapuram

9. Who has not participated in Vaikkam Sathyagraha ?
   A) K. Kelappan
   B) K. P. Kesava Menon
   C) A. K. Gopalan
   D) Mannath Padmanabhan

10. Who among the following became the member of 'Malayala Pradesh Congress Committee' ?
   A) Kuttimalu Amma   B) Kittur Channamma
   C) Captain Lakshmi   D) Akkama Cherian

A

11. Father of Indian Unrest
    A) Lala Lajpat Rai
    B) Bhagat Singh
    C) Bipin Chandra Pal
    D) Bal Gangadhar Tilak

12. Mathikettan Shola National Park is situated in which District ?
    A) Wayanad
    B) Idukki
    C) Palakkad
    D) Pathanam Thitta

13. Bhakra Nangal Dam is across which river ?
    A) Kaveri
    B) Mahanadi
    C) Satluj
    D) Krishna

14. Current General Manager of South Eastern Railway
    A) A. K. Goel
    B) S. Gehlot
    C) A. Datta
    D) B. K. Jain

15. Which company has launched BBM money transfer service in India ?
    A) Microsoft
    B) Sony
    C) Apple
    D) Black Berry

16. Who among the following is not the Goodwill Ambassador of India in Rio Olympics ?
    A) Sachin Tendulkar
    B) Abinav Bindra
    C) Sushil Kumar
    D) Salman Khan

17. 2015 Kendra Sahitya Academy Award Winning Book
    A) Agnisakshi
    B) Ratrimazha
    C) Marannu Vecha Vasthukkal
    D) Aarachaar

18. Which is known as Indian Education Commission ?
    A) Kothari Commission
    B) Mudaliar Commission
    C) Radhakrishnan Commission
    D) Saikia Committee

19. 'Tamasa' is the dance form of
    A) Gujarat
    B) Rajasthan
    C) Maharashtra
    D) Bihar

20. Which day was celebrated as National Education Day ?
    A) September 10
    B) November 11
    C) October 2
    D) December 20

21. If $\vec{v} = x^2\,\hat{i} + y^2\,\hat{j} + z^2\,\hat{k}$, find div (curl $\vec{v}$).

    A) 0

    B) $2\,(x + y + z)$

    C) $2\left(x\hat{i} + y\hat{j} + z\hat{k}\right)$

    D) 1

22. Find the Laplace transform of cosh at

    A) $\dfrac{s}{s^2 + a^2}$

    B) $\dfrac{a}{s^2 - a^2}$

    C) $\dfrac{s}{s^2 - a^2}$

    D) $\dfrac{a}{s^2 + a^2}$

23. Find the rank of $\begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 2 \\ 0 & 0 & 0 \end{bmatrix}$

    A) 2   B) 3   C) 8   D) 0

24. Find the general solution of the differential equation $(D^3 - D^2 - D + 1)\,y = 0$.

    A) $c_1 e^x + c_2 e^x + c_3 e^{-x}$

    B) $c_1 e^{-x} + c_2 e^{-x} + c_3 e^x$

    C) $(c_1 + c_2 x)\,e^{-x} + c_3 e^x$

    D) $c_1 e^{-x} + (c_2 + c_3 x)\,e^x$

25. If C is the unit circle, $\displaystyle\oint_c \dfrac{dz}{z^2 + 4} = ?$

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

    B) 0

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

    D) $\dfrac{\pi}{6}$

A

26. Pick up the incorrect statement from the following :

A) The straight distance between end points of a suspended tape is reduced by an amount called the sag correction.

B) While measuring a distance with a tape of length 100.005 m, the distance should be increased by 0.005 m for each tape length.

C) An increase in temperature causes a tape to increase in length and the measured distance is too large.

D) A 100 m tape of cross section 10 mm × 0.25 mm stretches about 10 mm under 5 kg pull.

27. A stone of mass 1 kg is tied to a string of length 1 m and whirled in a horizontal circle at a constant angular speed 5 rad/sec. The tension in the string is

A) 30 N   B) 25 N

C) 15 N   D) 10 N

28. The ratio of the moment of inertia of a rectangle about its centroidal axis to that about its base, is

A) 1/3   B) 1/4

C) 3/4   D) 4

29. Ultimate strength to cement is provided by

A) Di-calcium silicate

B) Tri-calcium silicate

C) Tri-calcium aluminate

D) Tetra calcium alumino ferrite

30. The portion of the brick without a triangular corner equal to half the width and half the length, is called

A) Brick bat   B) Queen closer

C) Squint brick   D) King closer

31. An industrial heat pump operates between the temperatures of 27° C and –13° C. The rates of heat addition and heat rejection are 750 W and 1000 W respectively. The COP for the heat pump is

A) 7.5

B) 6.5

C) 4.0

D) 3.0

32. A hydraulic turbine develops 1000 kW power for a head of 40 m. If the head is reduced to 20 m, the power developed (in kW) is

A) 177

B) 354

C) 500

D) 800

33. Two mating spur gears have 40 and 120 teeth respectively. The pinion rotates at 1200 rpm and transmits a torque of 20 Nm. The torque transmitted by gear is

A) 80 Nm

B) 30 Nm

C) 40 Nm

D) 60 Nm

34. Misrun is a casting defect which occurs due to

A) Very high pouring temperature of the molten metal

B) Insufficient fluidity of the molten metal

C) Absorption of gases by the liquid metal

D) Improper alignment of the mould flasks

35. Which of the following arc welding process does not use consumable electrode ?

A) GTAW

B) GMAW

C) SAW

D) None of these

A

36. A 500 kVA transformer has full load efficiency of 95% at UPF. It gives the same efficiency at 60% of full load and at UPF. The iron loss of the transformer is

A) 10.35 kW

B) 9.87 kW

C) 9.08 kW

D) 10.71 kW

37. Leakage flux in an induction motor is the flux that

A) Links stator and rotor windings

B) Leaks through the machine

C) Links stator winding or the rotor winding but not both

D) Links none of the windings

38. It is desired to have a constant direct current through an ideal inductor, the nature of the voltage source must be

A) Constant voltage

B) Linearly increasing voltage

C) Exponentially increasing voltage

D) An ideal impulse

39. A filament bulb rated at 500 W, 100 V is to be connected in series with capacitance across 220 V, 50 Hz supply. What will be the value of the capacitor such that the voltage across the bulb and the power consumed by the bulb are according to the rating of the bulb ?

A) 78 μF

B) 81 μF

C) 90 μF

D) 86 μF

40. In delta to star transformation, if the three elements of the delta connection are scaled by a factor 'm', m > 0, the elements of the corresponding star equivalent will be scaled by a factor of

A) m^2

B) $\sqrt{m}$

C) $\frac{1}{m}$

D) m

41. In an OPAMP out offset voltage due to input offset current is given by

    A) $V_o = I_{Io} R_i$

    B) $V_o = I_{Io} \dfrac{R_f}{R_i + R_f}$

    C) $V_o = I_{Io} R_f$

    D) $V_o = -I_{Io} R_i$

42. For a PN diode, maximum reverse bias potential that can be applied before entering a zener region is called

    A) Break down voltage

    B) Peak inverse voltage

    C) Reverse bias voltage

    D) None of the above

43. In a fullwave rectifier the DC voltage is given by

    A) $V_{dc} = 0.318 \, V_m$

    B) $V_{dc} = 0.836$

    C) $V_{dc} = 0.218 \, V_m$

    D) $V_{dc} = 0.636 \, V_m$

44. Frequency of oscillation for an RC phase shift oscillator is given by

    A) $f = \dfrac{1}{2\pi RC \sqrt{6 + \dfrac{4R_c}{R}}}$

    B) $f = \dfrac{1}{2\pi RC}$

    C) $f = \dfrac{1}{2\pi RC \sqrt{4 + \dfrac{6R_c}{R}}}$

    D) $f = \dfrac{1}{2\pi \sqrt{RC}}$

45. If delay line is not used in vertical section of a CRO

    A) Initial Part is lost

    B) Final Part is lost

    C) No signal in the display

    D) Always shows a horizontal line

46. What will be the output of the following program ?
```
void main()
{
int i=1;
printf("%d", i=++i==1);
}
```
   A) 0   B) 1   C) 2   D) error

47. What will be the value of 'f' after the execution of the following program ?
```
void main()
{
char a;
float f = 10;
for(a=1; a<=5;a++)
{ f-=.2; }
printf("\nf=%g",f);
}
```
   A) 5.0   B) 9   C) 9.0   D) error

48. What will be the output of the following program ?
```
#define abc(x,y) x*y
void main()
{
int a=1, b=2;
printf("%d",abc(a+1,b-2));
}
```
   A) 0   B) 1   C) 2   D) 3

49. Which statement is added to the following program such that address of "r1" gets stored in "r2" ?
```
void main()
{
int*r2;
void abc(int **);
abc(&r2);
printf("%d", *r2);
}
void abc(int **r3)
{
int r1=5;
/*add statement here*/
}
```
   A) *r2 = &r1   B) *r1 = &r3   C) *r3 = &r1   D) none of the above

50. The CPU can also be called as
   A) Processor hub   B) ISP
   C) Node   D) All the above

51. In thermodynamics, pure substance is the one which
   A) Behaves like a perfect gas
   B) Consists of only a single chemical species
   C) Has no dissolved impurities
   D) Has a number of chemical species but has constant composition

52. A thermodynamic cycle consisting of two reversible isothermal processes and two reversible isobaric processes is known as
   A) Otto cycle   B) Brayton cycle   C) Stirling cycle   D) Erikson cycle

53. Entropy of mixing is
   A) Zero
   B) Positive
   C) Negative
   D) Dependent on gases involved

54. The forces being dealt with in fluid statics are
   A) Gravity forces and surface tension   B) Gravity forces and viscous forces
   C) Gravity forces and pressure forces   D) None of these

55. The printer's ink is an example of
   A) Newtonian fluid
   B) Ideal fluid
   C) Thixotropic fluid
   D) Plastic fluid

56. An assumption not made in the derivation of Bernoulli's equation is
   A) Steady flow
   B) Uniform flow
   C) Inviscid flow
   D) Two-dimensional flow

57. Which of these are similar in forced convection and natural convection boundary layers ?
   A) Velocity variation
   B) Temperature variation
   C) Pressure variation
   D) Both velocity and temperature variation

58. With the rise in temperature, the thermal conductivity of solid metals
   A) Increases
   B) Decreases
   C) Remains the same
   D) None of these

59. For a part subjected to stress reversals, which of the following section is preferred ?
   A) Channel Section
   B) I-Section
   C) T-Section
   D) Hollow cylindrical pipe

60. For calculating stress in a hollow shaft subjected to torsion, the radius taken into consideration is
   A) Inner radius   B) Outer radius   C) Mean radius   D) None of these

61. A worm is basically a
   A) Spur gear
   B) Bevel gear
   C) Helical gear
   D) Herringbone gear

62. If the line of movement of the follower passes through the centre of rotation of the cam, then it is called
   A) Axial follower
   B) Radial follower
   C) Offset follower
   D) None of these

63. Hypoid gears are used for
   A) Parallel shafts
   B) Intersecting shafts
   C) Non-parallel non-intersecting shafts
   D) None of these

64. When the angle of inclination of the crank with inner dead centre of a reciprocating engine is 45°, then
   A) Primary force is maximum
   B) Secondary force is maximum
   C) Primary force is zero
   D) Secondary force is zero

65. A shaft with two rotors at its ends will have
   A) Zero node
   B) One node
   C) Two nodes
   D) Three nodes

66. The speed at which a shaft tends to vibrate violently in the transverse direction is called
   A) Transverse speed
   B) Vibrant speed
   C) Whipping speed
   D) Breaking speed

67. In thick film hydrodynamic journal bearings, the coefficient of friction
   A) Decreases with increase in load
   B) Increases with increase in load
   C) Is independent of load
   D) None of the above

68. For full depth involute spur gears, minimum number of teeth on the pinion to avoid interference depends on
   A) Pressure angle
   B) Speed ratio
   C) Circular pitch
   D) Pitch diameter

69. The commonly used type of brakes in motor cars is
   A) Shoe brake
   B) Band brake
   C) Internal expanding brake
   D) All of these

70. For new clutches, it is generally assumed that
    A) Wear is uniform
    B) Pressure is uniform
    C) Both pressure and wear are uniform
    D) None of these

71. The thermal efficiency of theoretical Otto cycle
    A) Increases with increase in compression ratio
    B) Increases with increase in isentropic index γ
    C) Is independent of pressure ratio
    D) All the above

72. In SI engines, supercharging leads to
    A) Increase in BHP and decrease in thermal efficiency
    B) Increase in thermal efficiency and decrease in BHP
    C) Increase in both thermal efficiency and BHP
    D) None of the above

73. Increase in compression ratio in a diesel engine
    A) Increases ignition delay   B) Reduces ignition delay
    C) Keeps ignition delay constant   D) Has no effect on ignition delay

74. Bleeding in steam turbines means
    A) Removal of condensed steam
    B) Extracted steam for preheating feed water
    C) Leakage of steam
    D) Steam doing no useful work

75. For a heat exchanger, the value of LMTD should be
    A) As large as possible   B) As small as possible
    C) Constant   D) None of these

76. In a vapour compression refrigeration cycle, the lowest temperature occurs in
    A) Compressor   B) Condenser   C) Evaporator   D) Throttle valve

77. The psychrometric process involved in summer air conditioning is
    A) Cooling and humidification   B) Cooling and dehumidification
    C) Evaporative cooling   D) Sensible cooling

78. Cavitation in water turbine results in
    A) Rough surfaces   B) Noisy operation
    C) Drop in discharge   D) All the above

A   -13-

79. Under part load operation, the turbine which is least efficient is
    A) Pelton turbine
    B) Francis turbine
    C) Kaplan turbine
    D) Propeller turbine

80. A photovoltaic cell converts
    A) Electromagnetic radiation directly into electricity
    B) Solar radiation into thermal energy
    C) Thermal energy into electricity
    D) All the above

81. The atomic packing factor for an FCC crystal is
    A) 0.68
    B) 0.74
    C) 0.78
    D) 0.84

82. Stacking fault is a
    A) Point defect
    B) Line defect
    C) Surface and grain boundary defect
    D) None of these

83. Pearlite is a combination of
    A) Ferrite and austenite
    B) Ferrite and cementite
    C) Ferrite and graphite
    D) Cementite and gamma iron

84. The pattern material for investment mould casting is
    A) Wood
    B) Plaster of Paris
    C) Wax
    D) Aluminium

85. Pipes of large length and diameters are made by
    A) Extrusion
    B) Slush casting
    C) Pressed casting
    D) Semi-centrifugal casting

86. Orthogonal cutting refers to cutting with
    A) Least chip strain
    B) Minimum radial force of cutting
    C) Zero degree inclination angle
    D) Negative rake

87. Projection welding is
    A) Single spot welding
    B) Multi-spot welding
    C) A type of arc welding
    D) Stud welding

88. USM is best suited for
    A) Brittle materials
    B) Ductile materials
    C) Non-ferrous alloys
    D) Plastics

89. Perthometer is a device used for measuring
    A) Surface hardness
    B) Surface roughness
    C) Flatness
    D) Gear tooth thickness

90. The algebraic difference between maximum limit and minimum limit of size is called
    A) Clearance
    B) Allowance
    C) Tolerance
    D) Maximum deviation

91. At break-even point
    A) Fixed costs and variable costs are equal
    B) Sales revenue and total cost are equal
    C) Sales revenue is more than total cost
    D) Sales revenue is less than total cost

92. Fulkerson's rule is associated with
    A) Transportation problem
    B) Assignment problem
    C) PERT/CPM
    D) Queing theory

93. Process layout is employed for
    A) Batch production
    B) Mass production
    C) Effective utilisation of machine
    D) None of these

94. Job evaluation is performed to
    A) Evaluate a worker
    B) Find the relative worth of jobs
    C) Fix a wage incentive scheme
    D) Help in value analysis

95. Functional organisation was introduced by
    A) F. W. Taylor   B) Gilbreth   C) Henri Fayol   D) Gantt

96. The cost corresponding to completion of activity within minimum possible time is known as
    A) Maximum cost   B) Minimum cost   C) Normal cost   D) Crash cost

97. The optimal solution of an LPP is attained at
    A) A corner point of feasible region
    B) An interior point of feasible region
    C) An exterior point of feasible region
    D) Any point of feasible region

98. In a transportation problem, the N-W corner method would yield
    A) An optimal solution
    B) An initial feasible solution
    C) Vogel's approximate solution
    D) None of these

99. Delphi technique is a _____ method of forecasting.
    A) Time series   B) Judgemental   C) Causal method   D) None of these

100. When a process is in statistical control, the process capability will be
    A) Equal to 6σ
    B) Greater than 6σ
    C) Less than 6σ
    D) None of these

122/2016

A