Maximum : 100 marks

Time : 1 hour and 15 minutes

1. In India, political parties are given recognition by :
   (A) President
   (B) Law Commission
   (C) Election Commission
   (D) Prime Minister

2. English is the official language of which of the following states :
   (A) Karnataka
   (B) Nagaland
   (C) Manipur
   (D) Arunachal Pradesh

3. When did Mahatma Gandhi National Rural Employment Guarantee Act enacted?
   (A) 2005
   (B) 2003
   (C) 2004
   (D) 2006

4. Who was also known as 'Sree Bhatarakan'?
   (A) Ramakrishna Pilla
   (B) V.T. Bhattathirippadu
   (C) Ayyankali
   (D) Chattampi Swamikal

5. Who founded 'Keraleeya Nair Samajam' in 1907?
   (A) V. T Bhattathiripad
   (B) Thycad Ayya
   (C) Mannathu Padmanaban
   (D) Sahodaran Ayyappan

6. 'Jathikummi', which criticised the prevailing caste system was written by :
   (A) Ramakrishna Pilla
   (B) V.T. Bhattathirippadu
   (C) Ayyankali
   (D) Pandit Karuppan

7. Paliyam Satyagraha was in the year :
   (A) 1947
   (B) 1937
   (C) 1939
   (D) 1940

8. Who is known as father of Library Movement in Kerala?
   (A) Ramakrishna Pilla
   (B) C.Kesavan
   (C) P.N. Panicker
   (D) Krishna Pillai

9. Which Novel of Lalithambika Antharjanam got Kendra Sahithya Academy Award in 1976?

(A) Kodumkatil Ninnu
(B) Agnisakshi
(C) Takarna Talamura
(D) Adyathe Kathakal

10. World Polio Day :

(A) October 22
(B) October 21
(C) October 24
(D) October 20

11. If $P=\begin{bmatrix}1 & 0 & 0\\ 0 & 1 & 0\\ 0 & 0 & 1\end{bmatrix}$, then P^2-2P is :

(A) P
(B) $-P$
(C) O
(D) $-2P$

12. Which of the following matrices is not invertible?

(A) $\begin{bmatrix}1 & 0\\ 1 & 1\end{bmatrix}$
(B) $\begin{bmatrix}1 & -2\\ -2 & 1\end{bmatrix}$
(C) $\begin{bmatrix}2 & 1\\ 6 & 3\end{bmatrix}$
(D) $\begin{bmatrix}4 & 4\\ 1 & -1\end{bmatrix}$

13. The number of terms in the expansion of $\left(x^2-\frac{2}{x^2}\right)^5$ is :

(A) 5
(B) 6
(C) 7
(D) 10

14. The value of $\cos 1^\circ \cos 2^\circ \cos 3^\circ \ldots\ldots \cos 100^\circ$ is :

(A) $\cos(100!)^\circ$
(B) $\cos 2550^\circ$
(C) 1
(D) 0

15. If $\frac{\sin\theta}{\cos\theta}+\frac{\cos\theta}{\sin\theta}=2$, then the value of θ is :

(A) $\frac{\pi}{2}$
(B) $\frac{\pi}{3}$
(C) $\frac{\pi}{4}$
(D) $\frac{\pi}{6}$

16. The acute angle between the lines $x-y=0$ and $y=0$ is :

(A) $\frac{3\pi}{4}$ (B) $\frac{\pi}{4}$

(C) $\frac{\pi}{3}$ (D) $\frac{\pi}{6}$

17. If $f(x)=\log_e(\log_e x)$, then the value of $f'(e)$ is :

(A) 0 (B) 1

(C) e (D) $\frac{1}{e}$

18. The minimum value of $f(x)=\frac{x^2-1}{x^2+1}$:

(A) doesn't exist (B) is 1

(C) is 0 (D) is -1

19. The integral of $x^3e^{x^2}$ w.r.t x is :

(A) $\frac{1}{2}(x^2-1)e^{x^2}+C$ (B) $\frac{1}{2}x^2(e^{x^2}-1)+C$

(C) $(x^2-1)e^x+C$ (D) $\frac{1}{3}e^{x^3}+C$

20. Solution of the differential equation $xdy-ydx=0$ is :

(A) $y=Cx$ (B) $y=x$

(C) $x^2-y^2=C$ (D) $x^2-y^2=0$

21. The number of bricks required for one cubic metre of brick mansonry are :

(A) 250 (B) 550

(C) 300 (D) 850

22. The silica in port land cement should be :

(A) 10 to 20% (B) 25 to 40 %

(C) 20 to 25% (D) 40 to 60%

23. Pile foundation is generally used when the soil is :

(A) compressible (B) water logging

(C) made-up-type (D) all of these

24. The correction to be applied to each 30 m chain for a line measured along a slope of 'θ' is :

(A) $30(1-\sin\theta)$ (B) $30(1-\cos\theta)$

(C) $30(1-\tan\theta)$ (D) $30(1-\cot\theta)$

25. The vertical distance above or below the datum is called :

(A) Reduced level of the point (B) Elevation of the point

(C) Height of the instrument (D) Either (A) or (B)

26. In compression ignition engines the compression ratio is :

(A) 4 – 6 (B) 6 – 12

(C) 10 –18 (D) 14 – 25

27. Which element is the final drive in power transmission of a vehicle?

(A) Propeller shaft (B) Gear box

(C) Differential (D) Fly wheel

28. How the ignition happened in Diesel engine?

(A) ratio of air fuel mixture (B) temperature in the compressed air

(C) use of a spark plug (D) use of a fuel injector

29. De – Laval turbine is a :

(A) simple impulse turbine (B) simple reaction turbine

(C) velocity compounded turbine (D) pressure compounded turbine

30. The governing method commonly used in steam turbine is by :

(A) hydraulic governing (B) by pass governing

(C) throttle governing (D) nozzle control governing

31. In a purely inductive circuit :

(A) Voltage lags behind the current by 90°

(B) Current leads the voltage by 90°

(C) Voltage leads the current by 90°

(D) Voltage and current are inphase

32. A 25 watts 110 volts lamp is to be operated from 230 volts supply , the value of resistance required to connect is series is :

(A) 0.22727 Ω (B) 4.4 Ω

(C) 525 Ω (D) 528 Ω

33. Capacitance of a spherical capacitor having 'r' metre radius with a charge of 'Q' coulombs at a potential of 'V' volts in the free space is :

(A) $4\pi \in_0 r$ farads

(B) $\frac{Q}{4\pi \in_0 r}$ farads

(C) $\frac{Q}{4\pi \in_0 \in_r r}$ farads

(D) $4\pi \in_0 \in_r r$ farads

34. An incandescent lamp of hot resistance 920 ohm, 230V is connected across 230 V, 50 Hz mains in 10 hours . The energy consumed by the lamp is :

(A) 57.5 Kwh

(B) 0.575 Kwh

(C) 575 Kwh

(D) 5.75 Kwh

35. Type of earthing is very suitable in rocky soil places is :

(A) Rod earthing

(B) Plate earthing

(C) Pipe earthing

(D) Strip earthing

36. Maximum forward current in case of signal diode is in the range of :

(A) 1-10 A

(B) 0.1 – 1A

(C) Few milliamperes

(D) Few nanoamperes

37. Which type of switch can move either one of the two positions?

(A) SPST

(B) SPDT

(C) DPDT

(D) DPST

38. The architecture of 8051 consists of :

(A) 4 latches

(B) 2-timer registers

(C) 4-onchip I/O ports

(D) All of the mentioned

39. During charging the specific gravity of the electrolyte of a lead acid battery :

(A) Increases

(B) Decreases

(C) Remains same

(D) Zero

40. The purpose of Linear Predictive Coding used in GSM is :

(A) Increase the bit rate

(B) Decrease the bit rate

(C) Maintain the bit rate

(D) None of the above

41. The stroke of the engine is known as :

(A) Volume of the cylinder

(B) Length of the connecting rod

(C) Internal diameter of cylinder

(D) Distance between TDC and BDC

42. Which part of a carburetor shuts of the air supply to aid cold starting?

(A) Throttle
(B) Strangler
(C) Float Needle valve
(D) Choke valve

43. The function of oil scrapper ring is to :

(A) Retain compression
(B) Lubricate cylinder walls
(C) Maintain vacuum
(D) Reduce piston wear

44. The escape of burned gases from the combustion chamber to the pistons and into the crankcase is called as :

(A) Gas Loss
(B) Blow by
(C) Crank case ventilation
(D) Bypass

45. The maximum pressure of air fuel mixture at the end of compression in petrol engine varies from :

(A) 10-30 Kg/cm^2
(B) 30-100 Kg/cm^2
(C) 6-10 Kg/cm^2
(D) 10-20 Kg/cm^2

46. The percentage of energy in the petrol burnt in the engine which is actually utilized in propelling the vehicle is :

(A) 40%
(B) 60%
(C) 25%
(D) 20%

47. Cetane number of diesel fuel is a measure of :

(A) Volatility
(B) Delay Period
(C) Viscosity
(D) Specific gravity

48. Excessive pressure build up in force feed lubrication system prevented by :

(A) Relief valve
(B) Stop valve
(C) Balancer
(D) Pressure reducing valve

49. A single cylinder two-stroke engine rotates at 3000 rpm. The number of power strokes per minute is :

(A) 1500
(B) 3000
(C) 750
(D) 6000

50. Water circulation in a thermo-syphon cooling system caused by :

(A) Conduction currents
(B) A belt driven water pump
(C) A belt driven impeller
(D) Change in density of water

51. Cylinder block construction by mono block is preferred to individual engine construction because of :

(A) Compact engine size
(B) Stiff and combined structure
(C) Easy manufacturing operations
(D) All of the above

52. The part of an overhead valve mechanism arranged between the valve tappet and rocker arm is :

(A) Cam follower
(B) Push rod
(C) Rocker shaft
(D) Cam shaft

53. The device that permits variation in the distance between the spring eyes of leaf spring as the spring flexes is called :

(A) Spring shackle
(B) Spring U bolt
(C) Spring hanger
(D) Spring leaf

54. A double acting shock absorber usually has :

(A) Pressure acting only one side
(B) Equal pressure on both side
(C) Unequal pressure on both sides
(D) None of the above

55. In the transmission system provision of slip joints allows a change in the :

(A) Angle of shaft
(B) Length of shaft
(C) Speed of rotation
(D) Amount of power transmission

56. The most effective section to build chassis frame against bending is :

(A) Rectangular bar
(B) Round Hollow tube
(C) Square hallow section
(D) Round bar

57. The parts of the clutch cover assembly that hold the pressure against the clutch plate are the :

(A) Release levers
(B) Thrust bearings
(C) Struts
(D) Springs

58. The coefficient of friction for the clutch facing is approximately :

(A) 0.4
(B) 0.8
(C) 1.2
(D) 0.1

59. The central gear of an epicyclic gear box known as :

(A) Ring gear
(B) Sun gear
(C) Planet gear
(D) Internal gear

60. Braking is produced by the frictional effect between the brake drum and the :

(A) Wheel Studs
(B) Wheel rim
(C) Brake shoes
(D) Wheel cylinder pistons

61. An under inflated tyre will wear the tread most :

(A) Near the centre
(B) In the cross section direction
(C) In the lateral direction
(D) Near the edges

62. Which of the following can be adjusted by modifying the tie road attachment length?

(A) Caster angle
(B) Toe in and out
(C) Camber angle
(D) Steering gear ratio

63. Ignition in a SI engine takes place when the piston is :

(A) Exactly at TDC position on its compression stroke
(B) Leaving the TDC position on its compression stroke
(C) Approaching TDC position on its exhaust stroke
(D) Approaching TDC position on its Compression stroke

64. Critical whirling speed of a propeller shaft is increased by :

(A) Increasing its length
(B) Decreasing its diameter
(C) Decreasing its length
(D) None of the above

65. The torque available at the contact between driving wheels and road is known as :

(A) Brake effort
(B) Tractive effort
(C) Clutch effort
(D) None of the above

66. The tool employed to measure the shaft run out is the :

(A) Feeler gauge
(B) Micrometer
(C) Dial gauge
(D) Caliper

67. Trafficators are light signal used for :

(A) Indicating the direction in which turning
(B) Light traffic
(C) Reversing the car in traffic
(D) Heavy Traffic

68. In a ventilated disc brake :

(A) A duct directs air towards the caliper for cooling while the vehicle is moving

(B) Caliper is covered with cooling fins

(C) Disc contains many small holes for optimum cooling performance

(D) Disc contains radial vanes between its rubbing surfaces for optimum cooling performance

69. The term ply rating with reference to a tyre refers to the :

(A) Actual number of plies

(B) Recommended inflation pressure

(C) Rated strength

(D) Aspect ratio

70. In the recirculating ball type steering gear, the balls travel between the ball nut and the :

(A) Gear rack

(B) Worm wheel

(C) Steering wheel shaft

(D) Worm shaft

71. The included angle in steering geometry is the sum of the :

(A) Camber and caster

(B) Caster and Steering axis inclination

(C) Camber and Steering axis inclination

(D) Camber and toe-in

72. Valve overlap is the number of degrees of camshaft rotation during which

(A) Both valves are closed

(B) Both valves are open

(C) Both (A) and (B)

(D) All of the above

73. In vehicles with tilt steering, the steering column is pivoted in :

(A) Upper bracket

(B) Lower bracket

(C) Tilt bracket

(D) Steering yoke joint

74. The caster is called as positive when the top of the kingpin is inclined to the :

(A) Rear of the wheel

(B) Front of the wheel

(C) Left of the wheel

(D) Right of the wheel

75. The vehicle ride will be comfortable if :

(A) Unsprung weight is kept minimum

(B) Sprung weight is kept minimum

(C) Vehicle weight is kept minimum

(D) All of the above

76. Which of the following gases is used as a fuel in internal combustion engine?

(A) Liquefied petroleum gas (B) Blast furnace gas

(C) Coke oven gas (D) All of the above

77. A mixture of theoretical air and fuel for complete combustion of fuel is called :

(A) Rich mixture (B) Lean mixture

(C) Air-Fuel mixture (D) Stoichiometric mixture

78. Combustion in compression ignition engine is :

(A) Homogenous (B) Laminar

(C) Heterogeneous (D) Turbulent

79. The process of breaking up of liquid fuel into droplets or fine spray is known as :

(A) Vaporization (B) Atomization

(C) Carburetion (D) Injection

80. In loop scavenging top of the piston is :

(A) Flat (B) Contoured

(C) Slanted (D) Depressed

81. The heat energy released by a fuel is measured by :

(A) Energy meter (B) Thermometer

(C) Calorimeter (D) Anemometer

82. The anti knock property of the fuel depends on its :

(A) Molecular structure (B) Self ignition temperature

(C) Chemical composition (D) All of the above

83. Which of the following is not an objective of super charging?

(A) To increase the compression ratio

(B) To overcome power losses at high altitudes

(C) To increase the power output

(D) To reduce the weight to power ratio

84. The Carnot cycle consist of :

(A) Two isothermal and two adiabatic process

(B) Two isothermal and two constant volume process

(C) Two isothermal and two constant pressure process

(D) Two isothermal and two isenthalpic process

85. If the air fuel mixture ignites before the spark takes place the condition known as :

(A) Detonation
(B) Ignition
(C) Pre ignition
(D) Knocking

86. The octane rating of commercially available petrol is :

(A) 85-95
(B) 95-100
(C) 100-110
(D) 110-125

87. The power actually developed by the engine cylinder of an IC engine known as :

(A) Theoretical power
(B) Actual power
(C) Indicated power
(D) None of the above

88. The ratio of the work obtained by the crankshaft in a given time to the energy supplied during the same time is known as :

(A) Mechanical efficiency
(B) Indicated thermal efficiency
(C) Overall efficiency
(D) Volumetric efficiency

89. In order to eliminate knocking in compression ignition engines, there should be :

(A) Short delay period
(B) Late auto ignition
(C) Low compression ratio
(D) High self ignition temperature for fuel

90. The ratio of the brake power to the indicated power is called :

(A) Indicated thermal efficiency
(B) Overall efficiency
(C) Mechanical efficiency
(D) Volumetric efficiency

91. During the charging the specific gravity of the electrolyte of lead acid battery :

(A) Increases
(B) Becomes zero
(C) Decreases
(D) Remains same

92. The capacity of battery is expressed in terms of :

(A) Current rating
(B) Voltage rating
(C) Ampere-hour-rating
(D) None of the above

93. When the lead acid battery fully charged electrolyte color will be?

(A) Dull
(B) Reddish
(C) Bright
(D) Milky

94. The frequency of voltage developed in alternator depends upon :

(A) Number of poles and rotational speed

(B) Rotational speed

(C) Number of poles, rotational speed and type of winding

(D) Number of poles

95. The most commonly used cranking motor drive is :

(A) Barrel type

(B) Bendix drive

(C) Friction clutch drive

(D) Over running clutch

96. The vapor lock problem may be caused in :

(A) Pipes

(B) Feed pump

(C) Float chamber

(D) All of the above

97. The difference of level of tip of main nozzle and fuel level in float chamber of a simple carburetor is called :

(A) Nozzle lip

(B) Throttle lip

(C) Throttle dip

(D) Nozzle dip

98. Which of the following is not true for internal combustion engine as compare to external combustion engine?

(A) It has a lower ratio of weight to output

(B) Higher overall efficiency

(C) They are all self starting

(D) Mechanical simplicity

99. The thermal efficiency of a diesel cycle having fixed compression ratio with increase in fuel cut off ratio will be :

(A) Decreases

(B) Increase

(C) Independent

(D) None of the above

100. The air gap between the central electrode and ground (or side) electrode of a spark plug is around :

(A) 0.2 mm

(B) 0.5 mm

(C) 1.5 mm

(D) 1 mm