

2010-ME-'14-26'

AI24BTECH11006 - Bugada Roopansha

- 14) A phenomenon is modeled using dimensional variables with k primary dimensions. The number of non-dimensional variables is:
 - a) k
 - b) n
 - c) $n - k$
 - d) $n + k$
- 15) A turbo-charged four-stroke direct injection diesel engine has a displacement volume of 0.0259 m^3 (25.9 litres). The engine has an output of 950 kW at 2200 rpm. The mean effective pressure (*in MPa*) is closest to:
 - a) 2
 - b) 1
 - c) 0.2
 - d) 0.1
- 16) One kilogram of water at room temperature is brought into contact with a high-temperature thermal reservoir. The entropy change of the universe is:
 - a) equal to entropy change of the reservoir
 - b) equal to entropy change of water
 - c) equal to zero
 - d) always positive
- 17) 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) 707
- 18) The material property which depends only on the basic crystal structure is:
 - a) fatigue strength
 - b) work hardening
 - c) fracture strength
 - d) elastic constant
- 19) In a gating system, the ratio 1 : 2 : 4 represents:
 - a) sprue base area: runner area :ingate area
 - b) pouring basin area: ingate area: runner area
 - c) sprue base area: ingate area: casting area
 - d) runner area: ingate area: casting area
- 20) A shaft has a dimension, $35 - 40 \pm 35$. The respective values of fundamental deviation and tolerance are:
 - a) $-0.025, \pm 0.008$
 - b) $-0.025, 0.016$
 - c) $-0.009, \pm 0.008$
 - d) $-0.009, 0.016$
- 21) In a CNC program block, $N002 G02 G91 X40 Z40...$, $G02$ and $G91$ refer to:
 - a) circular interpolation in counterclockwise direction and incremental dimension
 - b) circular interpolation in counterclockwise direction and absolute dimension
 - c) circular interpolation in clockwise direction and incremental dimension
 - d) circular interpolation in clockwise direction and absolute dimension
- 22) The demand and forecast for February are 12000 and 10275, respectively. Using single exponential smoothing method (*smoothing coefficient* = 0.25), the forecast for the month of March is:
 - a) 431
 - b) 9587
 - c) 10706
 - d) 11000
- 23) Little's law is a relationship between:
 - a) stock level and lead time in an inventory system
 - b) waiting time and length of the queue in a queuing system
 - c) number of machines and job due dates in a scheduling problem
 - d) uncertainty in the activity time and project completion time
- 24) Vehicle manufacturing assembly line is an example of:
 - a) product layout
 - b) process layout

- c) manual layout
- d) fixed layout

25) Simplex method of solving linear programming problems uses:

- a) all the points in the feasible region
- b) only the corner points of the feasible region
- c) intermediate points within the infeasible region
- d) only the interior points in the feasible region

26) Torque exerted on a flywheel over a cycle is listed in the table. Flywheel energy (*in J per unit cycle*) using Simpson's rule is:

Angle (<i>degree</i>)	Torque (<i>Nm</i>)
0	0
60	1066
120	−323
180	0
240	323
300	−355
360	0

- a) 542
- b) 993
- c) 1444
- d) 1986