PET-JULY. 2019
Subject: Mechanical Engineering:
50 Marks
(40 Multiple Choice Questions of 1.25 marks each to be attempted in 45-minutes choose one correct answer choice)

1:- A bolt of M 24 × 2 means that

a) the pitch of the thread is 24 mm and depth is 2 mm

b) the cross- sectional area of the threads is 24 mm^2

c) the nominal diameter of bolt is 24mm and the pitch is 2 mm

d) none of the above

2:- Three unbiased coins are tossed. What is the probability of getting at most two heads?

a) 3/4
b) 1/4
c) 3/8
d) 7/8

3:- The shear force in the centre of a simply supported beam carrying a uniformly distributed load of w per unit length is

a) zero

b) $wl^2/2$

c) $wl^2/4$

d) $wl^2/8$

4:- The slenderness ratio is the ratio of

a) area of column to least radius of gyration

b) length of column to least radius of gyration

c) least radius of gyration to area of column

d) least radius of gyration to length of column

5:- The size of cam depends upon

a) base circle

b) pitch circle

c) pitch curve

d) prime circle

6:- Energy can neither be created nor destroyed, but it can be transformed from one form to another. This statement is known as

a) Zeroth law of thermodynamics

b) First law of thermodynamics

c) Second law of thermodynamics

d) Kinetic theory of gases

7:- The throttling process is _____ process.

a) reversible

b)irreversible

c)reversible or irreversible

d) None of these

8:- A closed system undergoes a process 1 – 2 for which the values of $Q_{1\text{-}2}$ and $W_{1\text{-}2}$ are +20 kJ and +50 kJ, respectively. If the system is returned to state 1 and $Q_{2\text{-}1}$ is -10 kJ, what is the value of the work $W_{2\text{-}1}$?

a) +20 kJ

b) -40 kJ

c) -80 kJ

d) +40 kJ

9:- The coordination number for FCC crystal structure is

a) 4

b)8

c)12

d)16

10:- Which one of the following is correct? Babbits are used for

a) gears

b) bearings

c) bolts

d) clutch liners

11:- Monel metal is an alloy of

a) iron and carbon

b) copper and zinc

c) aluminium and zinc

d) copper and nickel

12:- Which of the following method is best for examining of surface flaws on the castings?

a) Pressure test
b) Magnetic particle test
c) Visual inspection
d) Acoustic emission test

13:- In value engineering, important consideration is given to

a) customer satisfaction

b) function concept

c) profit maximisation

d) cost reduction

14:- CPM is

a) time oriented technique

b) activity oriented technique

c) event oriented technique

d) both (b) and (c)

15:- The size of gear is usually specified by

a) pressure angle

b) pitch circle diameter

c) diametral pitch

d) circular pitch

16:-In the assemble design of shaft. Pulley and key, the weakest member is

a) pulley

b) key

c) shaft

d) none of these

17:- A-B-C analysis is used in

a) CPM

b) PERT

c) inventory control

d) all of these

18:- The sleeve or muff coupling is designed as a

a) Dun cylinder
b) Thick cylinder
c) Solid shaft
d) Hollow shaft

19:- In a flange coupling, the flanges are coupled together by means of

a) Bolts and nuts
b) Studs
c) Headless taper bolts
d) None of these

20:- The property of a material which enables it to resist fracture due to high impact loads is known as

a) Elasticity
b) Endurance
c) Strength
d) Toughness

21:- Rankine's theory of failure is applicable for following type of materials

a) Brittle
b) Ductile
c) Elastic
d) Plastic

22:- A model of casting, constructed to use for forming a mould in damp sand, is called as

a) Sand construction
b) Pattern
c) Cover
d) None of the above

23:- The temperature of arc in flame within the range of

a) 2000°C to 4000°C

b) 4000°C to 6000°C

c) below 1000°C

d) above 6000°C

24:- In a hot working process

a) grain structure of metal if refined

b) mechanical properties are improved

c) hardening is eliminated

d) all of the above

25:- Mechanical working processes are performed on metals

a) To achieve optimum mechanical properties in the metal
b) To improve the mechanical strength of the metal
c) To make metal dense
d) All of the above

26:- In circular drawing process, when the depth of drawing is more than the diameter of the die, then the process is called as

a) Forced drawing
b) Hollow drawing
c) Deep drawing
d) All of the above

27:- Interpolator in a CNC machine

a) Controls spindle speed
b) Coordinates axes movements
c) Operates tool changer
d) Commands canned cycle

28:- In a functional organisation

a) quality of work is better

b) wastage of material is minimum

c) specialised knowledge and guidance to individual worker is provided

d) all of the above

29:- Machinability tends to increase as

a) hardness decreases

b) ductility decreases

c) both (a) and (b)

d) hardness and ductility both increases

30:- This is the measured size of a finished part:

a) Actual size
b) Dimensional size
c) Production size
d) Basic size

31:- In compression ignition (CI) engine, the compression ratio is

a) Cylinder volume / Clearance volume
b) Swept Volume / Cylinder Volume
c) Clearance volume / Cylinder volume
d) Cylinder volume / Swept volume

32:- The relation between Indicated power (IP), Friction power (FP) and Brake power (BP) is

a) IP = FP – BP
b) IP = FP + BP
c) BP = IP + FP
d) BP = IP / FP

33:- Consumable electrode is used in

a) MIG welding

b) TIG welding

c) submerged arc welding

d) all of these

34:- In the case of flywheel, the maximum fluctuation of energy is the

a) sum of maximum and minimum energies

b) difference between the maximum and minimum energies

c) ratio of the maximum and minimum energies

d) ratio of the minimum and maximum energies

35:- A dummy activity in a network diagram

a) is represented by a dotted line

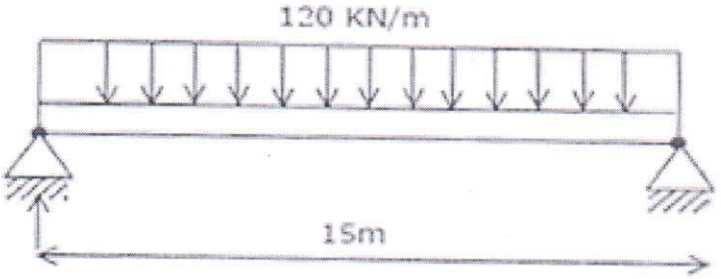
b) is an artificial activity

c) does not consume time or resources

d) all of these

Data for Q. 36-37 are given below. Solve the problem and choose the correct option.

A steel beam of breadth 120 mm and height 750 mm is loaded as shown in the figure.
Assume E_{steel}=200 GPa.



36:- The beam is subjected to a maximum bending moment of

a) 3375 kNm
b) 4750 kNm
c) 6750 kNm
d) 8750 kNm

37:-The value of maximum deflection of the beam is

a) 83.7 mm
b) 73.8 mm
c) 93.9 mm
d) 63.6 mm

38:-Two springs of stiffness k1 and k2 respectively are connected in series, the stiffness of composite spring is

a) $k = k_1 \times k_2$

b) $k = k_1 + k_2$

c) $k = k_1k_2 / k_1 + k_2$

d) $k = k_1 + k_2 / k_1k_2$

39:- Calculate logarithmic decrement if damping factor is 0.33.

a) 1.36
b) 3.23
c) 5.16
d) 2.19

40:- A mass of 4kg hanging from free end of spring. If stiffness of the spring is 1N/cm. Then angular frequency of the system is

a) 5 rad/s b) 25 rad/s c) 0.2 rad/s d) 0.04 rad/s

Answer key **PET-JULY. 2019**

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ANSWER KEYS

Q. No	Sol.	Q. No	Sol.	Q. No	Sol.
1	c	16	b	31	a
2	d	17	c	32	b
3	b	18	d	33	a
4	c	19	a	34	b
5	a	20	d	35	d
6	b	21	a	36	a
7	b	22	b	37	c
8	b	23	b	38	c
9	c	24	d	39	d
10	b	25	d	40	a
11	d	26	c		
12	c	27	b		
13	d	28	d		
14	b	29	c		
15	b	30	a		