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प्रश्नपुस्तिका

चाळणी परीक्षा

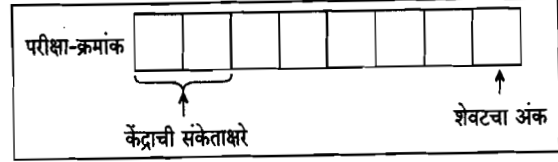
एकूण प्रश्न : 100

एकूण गुण : 200

वेळ : 2 (दोन) तास

सूचना

- (1) सदर प्रश्नपुस्तिकेत 100 अनिवार्य प्रश्न आहेत. उमेदवारांनी प्रश्नांची उत्तरे लिहिण्यास सुरुवात करण्यापूर्वी या प्रश्नपुस्तिकेत सर्व प्रश्न आहेत किंवा नाहीत याची खात्री करून घ्यावी. असा तसेच अन्य काही दोष आढळल्यास ही प्रश्नपुस्तिका समवेक्षकांकडून लगेच बदलून घ्यावी.
- (2) आपला परीक्षा-क्रमांक ह्या चौकोनांत न विसरता बॉलपेनने लिहावा.
- (3) वर छापलेला प्रश्नपुस्तिका क्रमांक तुमच्या उत्तरपत्रिकेवर विशिष्ट जागी उत्तरपत्रिकेवरील सूचनेप्रमाणे न विसरता नमूद करावा.
- (4) या प्रश्नपुस्तिकेतील प्रत्येक प्रश्नाला 4 पर्यायी उत्तरे सुचविली असून त्यांना 1, 2, 3 आणि 4 असे क्रमांक दिलेले आहेत. त्या चार उत्तरांपैकी सर्वात योग्य उत्तराचा क्रमांक उत्तरपत्रिकेवरील सूचनेप्रमाणे तुमच्या उत्तरपत्रिकेवर नमूद करावा. अशा प्रकारे उत्तरपत्रिकेवर उत्तरक्रमांक नमूद करताना तो संबंधित प्रश्नक्रमांकासमोर लायांकित करून दर्शविला जाईल याची काळजी घ्यावी. ह्याकरिता फक्त काळ्या शाईचे बॉलपेन वापरावे, पेन्सिल वा शाईचे पेन वापरू नये.
- (5) सर्व प्रश्नांना समान गुण आहेत. यास्तव सर्व प्रश्नांची उत्तरे द्यावीत. घाईमुळे चुका होणार नाहीत याची दक्षता घेऊनच शक्य तितक्या वेगाने प्रश्न सोडवावेत. क्रमाने प्रश्न सोडविणे श्रेयस्कर आहे पण एखादा प्रश्न कठीण वाटल्यास त्यावर वेळ न घालविता पुढील प्रश्नाकडे वळावे. अशा प्रकारे शेवटच्या प्रश्नापर्यंत पोहोचल्यानंतर वेळ शिल्लक राहिल्यास कठीण म्हणून वगळलेल्या प्रश्नांकडे परतणे सोईस्कर ठरेल.
- (6) उत्तरपत्रिकेत एकदा नमूद केलेले उत्तर खोडता येणार नाही. नमूद केलेले उत्तर खोडून नव्याने उत्तर दिल्यास ते तपासले जाणार नाही.
- (7) प्रस्तुत परीक्षेच्या उत्तरपत्रिकांचे मूल्यांकन करताना उमेदवारांच्या उत्तरपत्रिकेतील योग्य उत्तरांनाच गुण दिले जातील. तसेच "उमेदवाराने वस्तुनिष्ठ बहुपर्यायी स्वरूपाच्या प्रश्नांची दिलेल्या चार पर्यायपैकी सर्वात योग्य उत्तरेच उत्तरपत्रिकेत नमूद करावीत. अन्यथा त्यांच्या उत्तरपत्रिकेत सोडविलेल्या प्रत्येक चार चुकीच्या उत्तरांसाठी एका प्रश्नाचे गुण वजा करण्यात येतील".



ताकीद

ह्या प्रश्नपत्रिकेसाठी आयोगाने विहित केलेली वेळ संपेपर्यंत ही प्रश्नपुस्तिका आयोगाची मालमत्ता असून ती परीक्षाकक्षात उमेदवाराला परीक्षेसाठी वापरण्यास देण्यात येत आहे. ही वेळ संपेपर्यंत सदर प्रश्नपुस्तिकेची प्रत/प्रती, किंवा सदर प्रश्नपुस्तिकेतील काही आशय कोणत्याही स्वरूपात प्रत्यक्ष वा अप्रत्यक्षपणे कोणत्याही व्यक्तीस पुरविणे, तसेच प्रसिद्ध करणे हा गुन्हा असून अशी कृती करणाऱ्या व्यक्तीवर शासनाने जारी केलेल्या "परीक्षांमध्ये होणाऱ्या गैरप्रकारांना प्रतिबंध करण्याबाबतचा अधिनियम-82" यातील तरतुदीनुसार तसेच प्रचलित कायद्याच्या तरतुदीनुसार कारवाई करण्यात येईल व दोषी व्यक्ती कमाल एक वर्षाच्या कारावासाच्या आणि/किंवा रुपये एक हजार रकमेच्या दंडाच्या शिक्षेस पात्र होईल.

तसेच ह्या प्रश्नपत्रिकेसाठी विहित केलेली वेळ संपण्याआधी ही प्रश्नपुस्तिका अनधिकृतपणे बाळगणे हा सुद्धा गुन्हा असून तसे करणारी व्यक्ती आयोगाच्या कर्मचारीवृंदापैकी, तसेच परीक्षेच्या पर्यवेक्षकीयवृंदापैकी असली तरीही अशा व्यक्तीविरुद्ध उक्त अधिनियमानुसार कारवाई करण्यात येईल व दोषी व्यक्ती शिक्षेस पात्र होईल.

पुढील सूचना प्रश्नपुस्तिकेच्या अंतिम पृष्ठावर पहा

पर्यवेक्षकांच्या सूचनेविना हे सील उघडू नये

SEAL

B05

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A

कच्च्या कामासाठी जागा / SPACE FOR ROUGH WORK

1. The rank of a matrix $A = \begin{bmatrix} 2 & -4 & 6 \\ -1 & 2 & -3 \\ 3 & -6 & 9 \end{bmatrix}$ is

- (1) 3 (2) 2
(3) 0 (4) 1

2. If matrix $A = \begin{bmatrix} 1 & 2 & -3 \\ 0 & 2 & -6 \\ 0 & 0 & -3 \end{bmatrix}$, then the eigen values of $3A^3 + 5A^2 + 6A + I$ are

- (1) 51, 75, -32 (2) 15, 57, -53
(3) -15, -57, 53 (4) -51, -75, 35

3. If $I = \iint_S [(x^2 - yz) dx dz + (y^2 - zx) dx dz + (z^2 - xy) dx dy]$ where S is the surface of the rectangular parallelepiped, $0 \leq x \leq a$, $0 \leq y \leq b$, $0 \leq z \leq c$, then the value of I is

- (1) $abc(a + b + c)$ (2) $a^2b^2c^2(a + b + c)$
(3) $abc(a^2 + b^2 + c^2)$ (4) $abc\left(\frac{1}{a} + \frac{1}{b} + \frac{1}{c}\right)$

4. If $I = \iint_S (\nabla \times \vec{F} \cdot \hat{n}) dS$ where $\vec{F} = (2x - y) i - yz^2 j - y^2z k$ and S is the open surface of the sphere $x^2 + y^2 + z^2 = a^2$ above the xy-plane, then the value of I is

- (1) πa (2) πa^2
(3) $-\pi a$ (4) $-\pi a^2$

5. Solution of the differential equation $f''(t) + 9f(t) = \cos(2t)$, with $f(0) = f'(0) = 0$ is

- (1) $f(t) = \frac{1}{5} [\cos(2t) - \cos(3t)]$ (2) $f(t) = \frac{1}{5} [\sin(3t) - \sin(2t)]$
(3) $f(t) = \frac{1}{5} [\cos(3t) - \cos(2t)]$ (4) $f(t) = \frac{1}{5} [\sin(2t) - \sin(3t)]$

6. Solution of the differential equation $\frac{d^2y}{dx^2} + y = \sin(3x) \cos(2x)$ is

(1) $y = G \cos x + G \sin x - \frac{1}{48} [\sin(5x) - 12x \cos x]$

(2) $y = G \cos x + G \sin x - \frac{1}{48} [\sin(5x) + 12x \cos x]$

(3) $y = G \cos x + G \sin x + \frac{1}{48} [\sin(5x) - 12x \cos x]$

(4) $y = G \cos x + G \sin x + \frac{1}{48} [\sin(5x) + 12x \cos x]$

7. The value of complex integral $I = \oint_{C:|z|=1} [z^4 e^{(1/z)}] dz$ is

(1) πi

(2) $\frac{\pi i}{12}$

(3) $-\frac{\pi i}{60}$

(4) $\frac{\pi i}{60}$

8. If X and Y are independent normal variates with mean 6, 7 and variances 9, 16 respectively satisfying the equation $P(X + Y \leq \lambda) = P(X - Y \geq 3\lambda)$, then the value of λ is

(1) 1

(2) 2

(3) 3

(4) 4

9. If $X \sim \beta(n, p)$, then $\text{Cov}\left(\frac{X}{n}, \frac{n-X}{n}\right)$ is

(1) $\frac{pq}{n}$

(2) $-\frac{pq}{n}$

(3) $\frac{pq}{n^2}$

(4) $\frac{p^2q^2}{n}$

10. The value of $I = \int_{x=-3}^{+3} x^4 dx$ by dividing integral into six equal parts and using

Simpson's one-third rule approximately equals to

(1) 115

(2) 98

(3) 125

(4) 90

कच्चा कामासाठी जागा / SPACE FOR ROUGH WORK

11. In single phase alloys, the commonly used mechanism for strengthening is/are by
(1) Grain size reduction (2) Solid-solution alloying
(3) Strain hardening (4) All of the above
-
12. The force which holds neutrons and protons together in a nucleus is
(1) Electrostatic force (2) Gravitational force
(3) Magnetic force (4) Nuclear force
-
13. The property of a metal by virtue of which it can withstand external force without rupture is
(1) Stiffness (2) Strength (3) Toughness (4) Hardness
-
14. Most widely used conducting materials are
(1) Gold and Silver (2) Copper and Aluminium
(3) Tungsten and Platinum (4) Germanium and Silicon
-
15. Which of the following statements is *not* true in connection with silver ?
(1) It has highest thermal and electrical conductivity.
(2) It is a highly ductile and malleable metal.
(3) It oxidises slowly in air.
(4) It cannot be alloyed with other metals.
-
16. The method to increase the yield strength of a crystalline material is
(1) Annealing (2) Grain refinement
(3) Normalizing (4) None of the above
-
17. Which of the following properties is *not* desirable for bearing alloy ?
(1) Good wearing quality
(2) Low coefficient of friction
(3) Low thermal conductivity
(4) High melting point

18. An increase in load at the free end of a cantilever is likely to cause failure
- (1) at the free end (2) at the mid of its length
(3) at the fixed support end (4) anywhere on the beam
-
19. Coplanar concurrent forces are those forces which
- (1) meet at one point, but their lines of action do not lie on the same plane.
(2) do not meet at one point and their lines of action also do not lie on the same plane.
(3) meet at one point and their lines of action also lie on the same plane.
(4) do not meet at one point, but their lines of action lie on the same plane.
-
20. If a shaft of diameter 'd' and length 'l' has been loaded axially, then the ratio of change in diameter to the original is called as
- (1) Longitudinal strain (2) Shear strain
(3) Volumetric strain (4) Lateral strain
-
21. The ratio of the lateral strain to the linear strain is called
- (1) Modulus of elasticity (2) Modulus of rigidity
(3) Bulk modulus (4) Poisson's ratio
-
22. If \vec{P} and \vec{Q} are two vectors and ' α ' is the angle between them, then the magnitude of their resultant by using parallelogram law is
- (1) $R = \sqrt{P^2 + Q^2 + 2P \cdot Q \cos \alpha}$
(2) $R = \sqrt{P^2 + Q^2 + 2P \cdot Q \sin \alpha}$
(3) $R = \sqrt{P^2 - Q^2 + 2P \cdot Q \cos \alpha}$
(4) $R = \sqrt{P^2 - Q^2 + 2P \cdot Q \sin \alpha}$
-
23. A continuous beam is one which is
- (1) fixed at both ends
(2) fixed at one end and free at the other end
(3) supported on more than two supports
(4) extending beyond the supports

24. The governor which is hunting is

- (1) more sensitive (2) less sensitive
(3) more stable (4) None of the above
-

25. The shaft and thrust bearing of a vertical shaft in a turbine is an example of

- (1) Complete constraint
(2) Incomplete constraint
(3) Successful constraint
(4) Unreliable constraint
-

26. The Von Mises theory is used for

- (1) brittle materials (2) ductile materials
(3) plastic materials (4) elastic materials
-

27. For a given lift of the follower of a cam follower mechanism, a smaller base circle diameter is desired

- (1) because it will give a steeper cam and higher pressure angle
(2) because it will give a profile with lower pressure angle
(3) because it will avoid jumping
(4) None of the above
-

28. In the formulation of Lewis equation for toothed gearing, it is assumed that tangential load acts on the

- (1) root of the tooth (2) pitch point
(3) tip of the tooth (4) None of the above
-

29. In design of clutches, it is more logical and safer to use

- (1) Uniform wear theory
(2) Uniform pressure theory
(3) Contact stress theory
(4) None of the above
-

30. An Otto cycle efficiency is higher than Diesel cycle efficiency for the same compression ratio and heat input, because in Otto cycle
- (1) Maximum temperature is higher
 - (2) Heat rejection is lower
 - (3) Combustion is at constant volume
 - (4) Expansion and compression are isentropic
-
31. The Darcy – Weisbach equation is commonly used for finding
- (1) Loss of head due to friction in pipes
 - (2) Loss of head due to turbulence
 - (3) Loss of head due to sudden enlargement
 - (4) Loss of head due to bend in the pipe
-
32. A pipe is replaced by two parallel pipes, each with half the cross-section of the original pipe. The discharge will
- | | |
|-------------------------------|-------------------------------|
| (1) remain the same | (2) increase by more than 10% |
| (3) decrease by more than 10% | (4) change by less than 5% |
-
33. In an irreversible process there is
- | | |
|------------------|---------------------|
| (1) loss of heat | (2) no loss of work |
| (3) gain of heat | (4) no gain of heat |
-
34. The reheating of steam in a steam turbine
- (1) increases the work done through the turbine
 - (2) reduces erosion of the turbine blades
 - (3) increases the thermal efficiency of turbine
 - (4) All of the above
-
35. The radial heat transfer rate through hollow cylinder increases as the ratio of outer radius to inner radius
- | | |
|----------------------|-----------------------|
| (1) decreases | (2) increases |
| (3) remains constant | (4) None of the above |
-

कच्च्या कामासाठी जागा / SPACE FOR ROUGH WORK

36. When 0.83% carbon eutectoid steel is slowly cooled from 750°C to room temperature,

- (1) Austenite transforms to martensite (2) Austenite transforms to pearlite
 (3) Austenite transforms to cementite (4) Pearlite transforms to ferrite

37. Match the List I (Alloying elements of Cast Iron) with List II (Properties imparted) and choose the correct alternative from those given below :

<i>List I</i>					<i>List II</i>				
<i>Alloying elements of Cast Iron</i>					<i>Properties imparted</i>				
P.	Silicon				I.	Decreases fluidity			
Q.	Sulphur				II.	Promotes graphitization			
R.	Manganese				III.	Lowers melting point			
S.	Phosphorus				IV.	Promotes resistance to graphitization			
	P	Q	R	S					
(1)	II	IV	I	III					
(2)	III	IV	I	II					
(3)	II	I	IV	III					
(4)	I	III	II	IV					

38. Match the List I (Heat treatment process) with List II (Application) and choose the correct alternative from those given below :

<i>List I</i>					<i>List II</i>				
<i>Heat treatment process</i>					<i>Application</i>				
P.	Grey cast iron				I.	Rolling mill rolls			
Q.	White cast iron				II.	Crank shaft			
R.	Medium carbon steel				III.	Surgical instruments			
S.	Stainless steel				IV.	Machine tool bed			
	P	Q	R	S					
(1)	IV	I	II	III					
(2)	I	IV	II	III					
(3)	II	IV	III	I					
(4)	II	I	IV	III					

39. Atomized iron powder having an apparent density of 2350 kg/m^3 has a compression ratio of 3 at compact pressure of 600 MPa. To compact 1000 bushes of $\text{Ø}20$ mm outer diameter, $\text{Ø}10$ mm inside diameter and 14 mm long, the mass of the powder required is

- (1) 32.3 kg (2) 23.3 kg
 (3) 20.6 kg (4) 16.6 kg

40. The correct sequence of the processes involved in powder metallurgy is

- (1) Blending, Compacting, Sintering and Sizing
 (2) Blending, Compacting, Sizing and Sintering
 (3) Compacting, Sizing, Blending and Sintering
 (4) Compacting, Blending, Sizing and Sintering

41. Match the List I (Casting process) with List II (Mould making technique) and choose the correct alternative from those given below :

List I

Casting process

- P. Green sand moulding
 Q. Shell moulding
 R. Investment moulding
 S. Ceramic moulding

List II

Mould making technique

- I. Pouring
 II. Dipping
 III. Compaction
 IV. Resin bonding

P Q R S

- (1) II I IV III
 (2) I III II IV
 (3) III IV II I
 (4) IV II III I

42. Match the List I (Casting process) with List II (Product produced) and choose the correct alternative from those given below :

<i>List I</i>				<i>List II</i>			
<i>Casting process</i>				<i>Product produced</i>			
P.	Centrifugal casting			I.	Large bells		
Q.	Sand casting			II.	I.C. Engine pistons		
R.	Die casting			III.	Turbine blades		
S.	Investment casting			IV.	Pulleys		

- | | P | Q | R | S |
|-----|----|-----|-----|-----|
| (1) | IV | I | II | III |
| (2) | IV | II | I | III |
| (3) | I | IV | III | II |
| (4) | I | III | IV | II |

43. In a sand casting process, a sprue of $\varnothing 10$ mm base diameter and 250 mm height leads to a runner which fills a cubicle mould cavity of 100 mm size. The volume flow rate (in mm^3/s) is

- (1) 0.8×10^5 (2) 1.1×10^5 (3) 1.7×10^5 (4) 2.3×10^5

44. A cast steel slab of dimension $30 \times 20 \times 5$ cm is poured horizontally using a side riser. The riser is cylindrical in shape with diameter and height, both equal to D. The freezing ratio of the mould, used in designing riser using Caine's method is approximately equal to

- (1) $\frac{8D}{75}$ (2) $\frac{4D}{75}$ (3) $\frac{75}{8D}$ (4) $\frac{75}{4D}$

45. A cubic casting of 50 mm side undergoes a volumetric solidification shrinkage and volumetric solid contraction of 4% and 6% respectively. No riser is used. Assume uniform cooling in all directions. The side of the cube after solidification and contraction is

- | | |
|--------------|--------------|
| (1) 49.96 mm | (2) 49.94 mm |
| (3) 48.94 mm | (4) 48.32 mm |

46. In a multi-pass wire drawing operation, a round bar of $\varnothing 10$ mm diameter and 100 mm length is reduced in cross-section by drawing successively through a series of seven dies of decreasing exit diameter. During each of these drawing operations, the reduction in cross-sectional area is 35%. The yield strength of the material is 200 MPa. Ignore strain hardening.

The total true strain applied and the final length (in mm), respectively, are

- | | |
|-------------------|-------------------|
| (1) 2.45 and 817 | (2) 2.45 and 345 |
| (3) 3.02 and 2040 | (4) 3.02 and 3330 |

47. A $\varnothing 25$ mm hole is punched in a $t = 2.5$ mm thick steel sheet having shear strength $\tau = 350$ MPa. If the diametral clearance is given by the expression $c = 0.0064 t \sqrt{\tau}$, the die bore diameter (in mm), punch diameter (in mm) and punch force (in kN) respectively are

- | | |
|-----------------------|-----------------------|
| (1) 25.0, 25.3, 171.8 | (2) 25.0, 24.7, 68.72 |
| (3) 24.7, 25.0, 171.8 | (4) 25.3, 25.0, 68.72 |

48. A $\varnothing 10$ mm diameter annealed steel wire is drawn through a die at a speed of 0.5 m/sec to reduce the diameter by 20%. The yield stress of the material is 800 MPa. Neglecting friction and strain hardening, the ideal stress required for drawing (in MPa) is

- | | |
|------------|------------|
| (1) 357.0 | (2) 178.5 |
| (3) 1287.5 | (4) 2575.0 |

कच्च्या कामासाठी जागा / SPACE FOR ROUGH WORK

49. In a single pass rolling process using 410 mm diameter steel rollers, a strip of width 140 mm and thickness 8 mm undergoes 10% reduction of thickness. The angle of bite, in radians, is

- (1) 0.006 (2) 0.031 (3) 0.062 (4) 0.600
-

50. Using direct extrusion process, a round billet of $\varnothing 100$ mm length and 50 mm diameter is extruded. Considering an ideal deformation (no friction and no redundant work) with extrusion ratio of 4 and the average flow stress of material 300 MPa, the extrusion pressure (in MPa) on the ram will be

- (1) 416 (2) 624 (3) 700 (4) 832
-

51. Two 8 mm thick steel plates are placed 5 mm apart and welded by a butt joint. Welding is carried out with voltage of 20 V and speed of 5 mm/s. Heat transfer efficiency is 0.80. If the heat required to melt steel is 10 J/mm^3 and melting efficiency is 0.625, the weld current (in Amperes) will be

- (1) 100 (2) 200 (3) 300 (4) 400
-

52. In a DC arc welding operation, the voltage-arc length characteristic was obtained as $V_{\text{arc}} = 20 + 5L$ where the arc length L was varied between 5 mm and 7 mm. Here V_{arc} denotes the arc voltage in volts. The arc current was varied from 400 A to 500 A. Assuming linear power source characteristic, the open circuit voltage and the short circuit current for the welding operation are

- (1) 45 V, 450 A (2) 75 V, 750 A
(3) 95 V, 950 A (4) 150 V, 1500 A
-

53. The DC power source for arc welding has the characteristic $3V + I = 240$ where $V =$ voltage and $I =$ current in Amp. For the maximum arc power at the electrode, voltage should be set at

- (1) 20 V (2) 40 V (3) 60 V (4) 80 V
-

54. Match the List I (Welding process) with List II (Heat source) and choose the correct alternative from those given below :

*List I**Welding process*

- P. Thermit welding
Q. Projection welding
R. MIG welding
S. Friction welding

*List II**Heat source*

- I. Electric arc
II. Mechanical work
III. Exothermic chemical reaction
IV. Ohmic resistance

- | | P | Q | R | S |
|-----|-----|-----|-----|----|
| (1) | IV | II | III | I |
| (2) | IV | III | I | II |
| (3) | III | I | IV | II |
| (4) | III | IV | I | II |

55. Spot welding of two 1 mm thick sheets of steel (density = 8000 kg/m^3) is carried out successfully by passing a certain current for 0.1 second through the electrodes. The resultant nugget formed is $\text{Ø}5 \text{ mm}$ in diameter and 1.5 mm thick. If the latent heat of fusion of steel is 1400 kJ/kg and the effective resistance in the welding operation is $200 \mu\Omega$, the current passing through the electrodes is approximately

- | | |
|------------|------------|
| (1) 1480 A | (2) 3300 A |
| (3) 4060 A | (4) 9400 A |

56. Which of the following is a non-traditional machining process ?

- | | | | |
|-------------|---------|--------------|-------------|
| (1) Milling | (2) EBM | (3) Drilling | (4) Turning |
|-------------|---------|--------------|-------------|

57. The pocket or resting position of the workpiece in a jig or fixture is referred to as a

- | | | | |
|----------|----------|----------|----------|
| (1) Rest | (2) Base | (3) Case | (4) Nest |
|----------|----------|----------|----------|

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58. Die blocks made in two or more sections are known as

- (1) Split die blocks
 - (2) Sectional die blocks
 - (3) Dual die blocks
 - (4) Progressive die blocks
-

59. If the die clearance is to be applied to the die opening, it should be added to the

- | | |
|--------------|-----------|
| (1) Die | (2) Punch |
| (3) Template | (4) Stock |
-

60. The three-position inclinable press is frequently referred to as

- (1) Closed-back inclinable press
 - (2) Open-back inclinable press
 - (3) Solid-gap press
 - (4) Gap-frame press
-

61. Which of the following is *not* the basic forging operation ?

- | | |
|---------------|-------------|
| (1) Upsetting | (2) Heading |
| (3) Fullering | (4) Staking |
-

62. A successful TQM program incorporates all *except*

- a. continuous improvement
 - b. employment improvement
 - c. benchmarking
 - d. centralized decision making authority
- | | |
|-------------|-------------|
| (1) Only d | (2) a and b |
| (3) b and c | (4) c and d |
-

63. Acceptable Quality Level (AQL) is associated with

- (1) Producer's risk
 - (2) Consumer's risk
 - (3) Lot Tolerance Percent Defective
 - (4) Average Outgoing Quality Limit
-

64. In the Computer Aided Design, the simplest solid objects are termed as

- (1) Entities
 - (2) Primitives
 - (3) Models
 - (4) Boxes
-

65. Which of the following process planning systems uses the similarity among components to retrieve the existing process plans ?

- (1) Generative approach
 - (2) Decision approach
 - (3) Variant Process Planning system
 - (4) None of the above
-

66. The volume of the space created within the virtual surfaces swept by the robot arm at the maximum and the minimum reach is called

- (1) Work place
 - (2) Work space
 - (3) Work volume
 - (4) Work area
-

67. Which of the following types of layout configurations is/are used in FMS ?

- (1) In-line
 - (2) Loop
 - (3) Ladder
 - (4) All of the above
-

68. In Computer Aided Manufacturing, the elements of CIM system are

- | | |
|----------------|----------------------|
| (1) Automated | (2) Optimized |
| (3) Integrated | (4) All of the above |
-

69. The current trends in manufacturing technology require high quality with acceptable levels of defects with a

- (1) Zero-defect philosophy
 - (2) Zero-error philosophy
 - (3) Zero-tolerance philosophy
 - (4) None of the above
-

70. The value is defined as the ratio of function or performance to

- | | |
|-------------|----------------------|
| (1) Utility | (2) Price |
| (3) Cost | (4) All of the above |
-

71. Concurrent Engineering deals with carrying out the following activities at the same time while designing the product :

- (1) Design and Sales
 - (2) Manufacturing and Sales
 - (3) Design and Re-engineering
 - (4) Design and Manufacturing
-

72. Product design deals with

- (1) Form and function
 - (2) Elements and weight
 - (3) Elements and material
 - (4) Size and shape
-

73. The initial cost of an equipment is ₹ 20,000 and it's life is estimated as 10 years. What is the rate of depreciation, when scrap value after it's life becomes zero ?

- (1) ₹ 1,000 per year (2) ₹ 2,000 per year
(3) ₹ 3,000 per year (4) ₹ 4,000 per year
-

74. For a small scale industry, the fixed cost per month is ₹ 5,000. The variable cost per product is ₹ 20 and sale price is ₹ 30 per piece. The break-even production per month will be

- (1) 300 (2) 460
(3) 500 (4) 1,000
-

75. Job evaluation is the method of determining the

- (1) relative worth of a job
(2) skills required of a worker
(3) contribution of a worker
(4) effectiveness of various alternatives
-

76. Work sampling observations are taken on the basis of

- (1) Detailed calculations
(2) Convenience
(3) Table of random numbers
(4) Fixed percentage of daily production
-

77. Which of the following techniques is used for work measurement ?

- (1) Method Study
(2) Time Study
(3) Ergonomics
(4) Productivity Rational Technique
-

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78. Name the scientists who developed the technique of Business Process Re-engineering.

- (1) Tolstoy and Ali (2) Risbood and Marshal
(3) Hammer and Champy (4) Taylor and Gilbreth
-

79. In work measurement, 1 TMU is equal to

- (1) 0.6 min (2) 0.06 min
(3) 0.006 min (4) 0.0006 min
-

80. Standard Time in Time Study is calculated by which of the following formulae ?

- (1) $ST = OT \times R + A$
(2) $ST = OT + A$
(3) $ST = R + A$
(4) $ST = OT + R + A$
-

81. PERT stands for

- (1) Product Evaluation Refining Technique
(2) Production Enhancement Review Technique
(3) Peripheral Evaluation Rigid Technique
(4) Program Evaluation Review Technique
-

82. Which of the following is *not* the example of variable cost ?

- (1) Direct productive labour
(2) Direct materials
(3) Direct expenses
(4) Administrative expenses
-

83. According to which of the following methods is the depreciation fund more during the early years, when repairs and renewals are not costly ?

- (1) Sinking Fund Method
 - (2) Annuity Method
 - (3) Diminishing Balance Method
 - (4) Sum of the Year's Digit Method
-

84. The angle between the sales income line and the total cost line is called as the

- (1) Angle of reflection
 - (2) Angle of incidence
 - (3) Angle of repose
 - (4) None of the above
-

85. Which of the following is *not* the Leverage Ratio ?

- (1) Acid Test Ratio
 - (2) Debt Equity Ratio
 - (3) Assets Coverage Ratio
 - (4) Debt-Service Coverage Ratio
-

86. In Reliability, MTBF stands for

- (1) Mean Time Batch Forecasting
 - (2) Maximum Time Batch Failures
 - (3) Mean Time Between Failures
 - (4) Mean Time Between Force
-

87. The primary purpose of employee safety programme is to preserve the employees'

- (1) Mental health
 - (2) Physical health
 - (3) Emotional health
 - (4) All of the above
-

88. Which of the following is *not* connected with employees' safety and health ?

- (1) The Factories Act, 1948
 - (2) The Mines Act, 1952
 - (3) The Payment of Bonus Act, 1965
 - (4) The Dock Workers (Safety, Health and Welfare) Act, 1986
-

89. Which of the following explains the term 'Union ballots' ?

- (1) A ballot is the system by which a union member votes for e.g. Industrial Action
 - (2) A ballot is the method by which a union expels members
 - (3) A ballot is the method by which a union recruits members
 - (4) A ballot is the system by which a union member puts forward information for listing
-

90. The balance of power is not vested with any one group; rather it is maintained between the parties to the "Industrial Relations". This is the essence of the

- | | |
|------------------------|---------------------|
| (1) Pluralist approach | (2) System approach |
| (3) Unitary approach | (4) Social approach |
-

91. In which of the following years was the Workmen's Compensation Act introduced ?

- | | |
|----------|----------|
| (1) 1948 | (2) 1976 |
| (3) 1923 | (4) 1961 |
-

92. Break-Even Point is a point of intersection of

- (1) Variable Cost and Total Sales lines
 - (2) Total Cost and Total Sales lines
 - (3) Fixed Cost and Variable Cost lines
 - (4) Total Cost and Variable Cost lines
-

93. Which of the following is *not* a function of production planning and control ?
- (1) Scheduling
 - (2) Process Planning
 - (3) Expediting
 - (4) Replacement Analysis
-
94. A systematic recording and critical examination of existing method in order to develop new effective method is called
- (1) Time study
 - (2) Linear programming
 - (3) TPM
 - (4) Method study
-
95. Which of the following is a method of forecasting ?
- | | |
|------------------|--------------------|
| (1) CPM | (2) Moving Average |
| (3) Merit rating | (4) PMTS |
-
96. Which Act of the Parliament defines a 'trade union' and governs much of the law on Industrial Relations ?
- (1) The Trade Union Act, 1955
 - (2) The Trade Union and Labour Relations Act, 2005
 - (3) The Trade Union and Labour Relations (Consolidation) Act, 1991
 - (4) The Trade Union and Labour Relations (Consolidation) Act, 1992
-
97. In a CNC program block N002 G02 G91 X40 Z40 ..., G02 and G91 refer to
- (1) Circular interpolation in counter clockwise direction and incremental dimension
 - (2) Circular interpolation in counter clockwise direction and absolute dimension
 - (3) Circular interpolation in clockwise direction and incremental dimension
 - (4) Circular interpolation in clockwise direction and absolute dimension

98. Match the List I with List II and choose the correct alternative from those given below :

<i>List I</i>		<i>List II</i>	
<i>NC Code</i>		<i>Definition</i>	
P.	M05	I.	Absolute coordinate system
Q.	G01	II.	Dwell
R.	G04	III.	Spindle stop
S.	G90	IV.	Linear interpolation

- | | P | Q | R | S |
|-----|-----|-----|----|----|
| (1) | II | III | IV | I |
| (2) | III | IV | I | II |
| (3) | III | IV | II | I |
| (4) | IV | III | II | I |

-
99. "Operators simply load new programs as necessary, to produce different products", describes
- (1) Automatically guided vehicles
 - (2) Flexible manufacturing system (FMS)
 - (3) Vision system
 - (4) Process control

-
100. Concurrent Engineering is *not* related with
- (1) DFM
 - (2) DFMA
 - (3) Simultaneous Engineering
 - (4) Sum of Digits Method

सूचना — (पृष्ठ 1 वरून पुढे.....)

- (8) प्रश्नपुस्तिकेमध्ये विहित केलेल्या विशिष्ट जागीच कच्चे काम (रफ वर्क) करावे. प्रश्नपुस्तिकेव्यतिरिक्त उत्तरपत्रिकेवर वा इतर कागदावर कच्चे काम केल्यास ते काँपी करण्याच्या उद्देशाने केले आहे, असे मानले जाईल व त्यानुसार उमेदवारावर शासनाने जारी केलेल्या “परीक्षांमध्ये होणाऱ्या गैरप्रकारांना प्रतिबंध करण्याबाबतचे अधिनियम-82” यातील तरतुदीनुसार कारवाई करण्यात येईल व दोषी व्यक्ती कमाल एक वर्षाच्या कारावासाच्या आणि/किंवा रुपये एक हजार रकमेच्या दंडाच्या शिक्षेस पात्र होईल.
- (9) सदर प्रश्नपत्रिकेसाठी आयोगाने विहित केलेली वेळ संपल्यानंतर उमेदवाराला ही प्रश्नपुस्तिका स्वतःबरोबर परीक्षाकक्षाबाहेर घेऊन जाण्यास परवानगी आहे. मात्र परीक्षा कक्षाबाहेर जाण्यापूर्वी उमेदवाराने आपल्या उत्तरपत्रिकेचा भाग-1 समवेक्षकाकडे न विसरता परत करणे आवश्यक आहे.

नमुना प्रश्न

Pick out the correct word to fill in the blank :

Q.No. 201. I congratulate you _____ your grand success.

- (1) for (2) at
(3) on (4) about

ह्या प्रश्नाचे योग्य उत्तर “(3) on” असे आहे. त्यामुळे या प्रश्नाचे उत्तर “(3)” होईल. यास्तव खालीलप्रमाणे प्रश्न क्र. 201 समोरील उत्तर-क्रमांक “(3)” हे वर्तुळ पूर्णपणे छायांकित करून दाखविणे आवश्यक आहे.

प्र.क्र. 201. (1) (2) (3) (4)

अशा पद्धतीने प्रस्तुत प्रश्नपुस्तिकेतील प्रत्येक प्रश्नाचा तुमचा उत्तरक्रमांक हा तुम्हाला स्वतंत्ररीत्या पुरविलेल्या उत्तरपत्रिकेवरील त्या त्या प्रश्नक्रमांकासमोरील संबंधित वर्तुळ पूर्णपणे छायांकित करून दाखवावा. ह्याकरिता फक्त काळ्या शाईचे बॉलपेन वापरावे, पेन्सिल वा शाईचे पेन वापरू नये.

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