# RVUNL AEN & JEN

## Mechanical Engineering

Mini Mock Challenge
(June 19th - June 20th 2021)

## Questions & Solutions

1.  Find the odd number/letters/ number part from the given alternatives.
    A. 120-80                          B. 57-19
    C. 45-30                          D. 63-42

    In each of the following questions, select the missing number from the given responses.

2.  MNOPWXYZRSTUBCD?
    A. A                              B. E
    C. I                              D. F

3.  Find the odd number / letters /number pair from the given alternatives.
    A. Rivulet                        B. Stream
    C. River                          D. Pond

4.  Which one of the given responses would be a meaningful order of the following?
    1) Atomic Age
    (2) Metallic Age
    (3) Stone Age
    (4) Alloy Age
    A. (1), (3), (4), (2)             B. (3), (2), (4), (1)
    C. (2), (3), (1), (4)             D. (4), (3), (2), (1)

5.  Yusuf Arakkal, who passed away recently, was a well-known personality of which field?
    A. Painting                       B. Sports
    C. Politics                       D. Scientists

6.  Tick the correct option of GDP (Gross Domestic Product) contributed by service sector in the past:
    A. During 2000-01 (GDP – 65.54%)   B. During 1980-81 (GDP – 50.00%)
    C. During 1950-51 (GDP – 34.63%)   D. During 2011-12 (GDP – 57.00%)

7.  The longest appendix ever removed was how much in length?
    A. 20 cm                          B. 22 cm
    C. 23.5 cm                        D. 28 cm

8.  At the Rio Olympics, who was the flagbearer of the Indian contingent?
    A. Narsingh Yadav                 B. Abhinav Bindra
    C. Dipa Karmakar                  D. Sania Mirza

9.  Apart from the Himalayan region, the forest soils occur which of the following?
    A. Western Ghats                  B. Eastern Ghats
    C. Southern Ghats                 D. Both A and B

10. Consider the following statement regarding announcements in Rajasthan Budget, 2021-22

    A) Chief Minister announced a new scheme 'Mukhyamantri Krishak Saathi Scheme' under this budget.

    B) Under this scheme, Rs 2 Crore allocated for various farmer welfare works.

Which of the statements given above is/are correct?

A. A only
B. B only

C. Both A and B
D. Neither A nor B

11. Match List I with List II and with reference to different schemes launched in Rajasthan, select the correct answer code given below:

List I

Yojana - Launch Year

A). Nishulk Dawa Yojna

B). Nishulk Janch Yojna

C). Nirogi Rajasthan Abhiyan

D). Palanhaar Yojna

List II

I. 2013

II. 2011

III. 2004-05

IV. 2019

Codes:

A. A-I B-II C-III D-IV
B. A-II B-I C-IV D-III

C. A-IV B-II C-III D-I
D. A-I B-IV C-III D-II

12. Recently in Budget 2021-22, which ambitious township scheme is announced by chief minister of Rajasthan?

A. Greater Sanchore Industrial Township

B. Greater Tapukara Industrial Township

C. Greater Bhiwadi Industrial Township

D. Greater Baran Industrial Township

13. Padam Awards were awarded in January 2021, three personalities form Rajasthan were awarded Padma Shree awards. Who among the following is awarded the Padma Shree award from Rajasthan?

A. Gulam Rasul Khan

B. Lakha Khan

C. Kanak Raju

D. Usha Yadav

14. Who has been appointed as the chief information commissioner of Rajasthan?

A. Niranjan Arya
B. DB Gupta

C. Shashi Kant Gupta
D. None of above

15. Which river of Rajasthan originates from Aravalli Range in Kotri tehsil of Udaipur and then it flows into Gujarat?

A. Sei
B. Western Banas

C. Sabarmati
D. Kantli

16. Gobardhan Scheme was launched in 2018 and recently a unified portal on this scheme is launched, this scheme is run by which ministry?
A. Ministry of Farmers and Agriculture
B. Ministry of Diary and Animal Husbandary
C. Ministry of Jal Shakti
D. None of above

17. Based on the district wise performance report of Pradhan Mantri Gramin Awas Yojana released on December 16,2020, which district got the first rankings in country under the scheme?
A. Jaipur                           B. Sikar
C. Sirohi                           D. Rajsamand

18. Which project is being run by government for successful implementation of MGNREGA in Rajasthan?
A. Apna Kaam Apna Daam             B. Pura Kaam Pura Daam
C. Shi Kaam Uchit Daam             D. Ek Kaam Ek Daam

19. In Rajasthan, "Mahaveer ji ki Lathmaar holi" is famous in _____.
A. Sangod ka nahan                 B. Bhinaay
C. Byawar                          D. Non of the above

20. As per the census 2011, Which of the following are the three top districts with highest total literacy in Rajasthan?
A. Kota, Jaipur, Jhunjhunu         B. Sikar, Alwar, Jhunjhunu
C. Kota, Jaipur, Ganganagar        D. Jaipur, Kota, Sikar

21. Which of the following wildlife sanctuaries is spread in Chittorgarh, Pratapgarh and Udaipur?
A. National Chambal Sanctuary      B. Sitamata Sanctuary
C. Kumbalgarh wildlife sanctuary   D. Jawahar sagar wildlife sanctuary

22. Which of the following breed of sheep is also known as "Bikaneri Chokhla"?
A. Chokhla                         B. Magra
C. Marwari                         D. Naali

23. Match List I and List II and select the correct answer using the codes given below:

| Name | - | Established year |
|---|---|---|
| A) Directorate of Agriculture Marketing | - | 1) 1974 |
| B) Rajasthan State Agriculture Marketing Board | - | 2) 1980 |
| C) RAJFED | - | 3) 1957 |
| D) National Institute of Agriculture Marketing | - | 4) 1988 |

Codes:
A. A 1, B 2, C 3, D 4              B. A 2, B 1, C 4, D 3
C. A 4, B 3, C2, D 1              D. A 2, B 1, C 3, D 4

24. Which district of Rajasthan produces the maximum wind energy?

    A. Bikaner                            B. Jaisalmer

    C. Jodhpur                           D. Pratapgarh

25. Register is a

    A. Set of capacitors used to register input instructions in a digital computer

    B. Set of paper tapes and cards put in a file

    C. Temporary storage unit within the CPU having dedicated or general purpose use

    D. Part of the auxiliary memory

26. Which of the following animals is dumb?

    A. Deer                              B. Giraffe

    C. Sag                               D. Yak

27. Sun Lab's Java Car uses technology to keep your car networked with the world outside.

    A. embedded                         B. spam

    C. smart Screen                     D. access Point

28. Which of the following is not a component of to qualify the "Green Embassy"?

    A. Rain water harvesting system

    B. Installation of solar panels on the roof

    C. Installation of air treatment filter in the office ventilation system

    D. Daily disposal of garbage generated in the embassy

29. a/b = c/d = e/f = 3, then $\dfrac{2a^2 + 3c^2 + 4e^2}{2b^2 + 3d^2 + 4f^2}$ =?

    A. 4                                 B. 9

    C. 15                                D. 12

30. By selling a watch for Rs. 132 a trade man got two successive profits of 10% and 20% respectively. Then, the resultant profit is

    A. 22%                               B. 30%

    C. 32%                               D. 34%

31. In a ΔABC, the medians *AD, BE* and *CF* passes through *G*. If *FG* = 3.5 cm, find *GC*.

    A. 6 cm                              B. 7 cm

    C. 8 cm                              D. 9 cm

32. $\left(\dfrac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}}\right)^2 + \left(\dfrac{\sqrt{5}-\sqrt{3}}{\sqrt{5}+\sqrt{3}}\right)^2$ is equal to:

    A. 64                                B. 62

    C. 66                                D. 68

33. एक शब्द का बहुवचन शब्द निम्न में से कौनसा है?

    A. अनेक                              B. प्रत्येक

    C. बहुत सारे                          D. अनेकों

34. सर्वनाम यानी सबके लिए नाम। इसका प्रयोग संज्ञा के स्थान पर किया जाता है।

    'कौन' सर्वनाम का गुणवाचक शब्द दिए गए विकल्पों में से चिन्हित कीजिए :

    A. कैसा
    B. कितना

    C. किस
    D. कितने

35. आचार्य प्रथम शास्त्री

    ,, शंकर शास्त्री

    ,, राम शास्त्री

    ,, इस चिन्ह को किस नाम से जाना जाता है?

    A. अनुवृत्ति चिन्ह
    B. विराम चिन्ह

    C. प्रश्नवाचक
    D. त्रुटि चिन्ह

36. निर्देशः प्रत्येक प्रश्न में एक वाक्य दिया हुआ है। कुछ वाक्य बिल्कुल शुद्ध हैं पर कुछ में गलती हैं। वाक्य के जिस भाग में गलती हो, उसके अनुक्रम (A), (B) या (C) पर सही का निशान लगाइये। यदि कोई गलती न हो, तो आपका उत्तर (D) होगा।

    **(A) समय बीतने के साथ ज्यों-ज्यों मनुष्य के /(B) रागात्मक संबंध बनते-बिगड़ते गए/(C) उनके जीवन की संकुलता बढ़ती गई । /(D) कोई गलती नहीं ।**

    A. वाक्य A
    B. वाक्य B

    C. वाक्य C
    D. कोई गलती नहीं

**Find the adverb of the given word.**

37. Scientific

    A. Science
    B. Scientist

    C. Scientifically
    D. Scientology

In the sentence identify the segment which contains the grammatical error. If the sentence has no error, then select 'No error'.
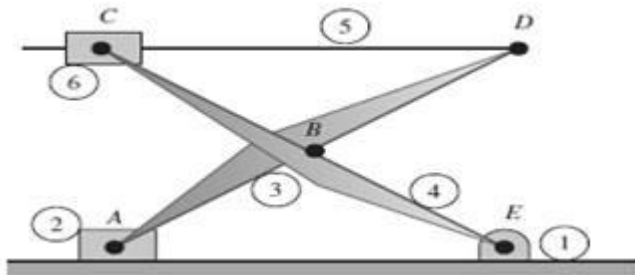
38. Everyone of us should realize that any act of negligence will cause a great harm to our country security.

    A. any act of negligence will cause
    B. No error

    C. Everyone of us should realize that
    D. a great harm to our country security

**Select the most appropriate option to fill in the blank.**

39. I accidentally cut _____ last night while opening the bottle.

    A. you
    B. him

    C. me
    D. myself

**Given below are four jumbled sentences. Pick the option that gives their correct order.**

40. P. They rule through their elected representatives.

    Q. Democracy is the primary goal of our Indian Constitution.

    R. If representatives do not rule according to the wishes of the people, they are changed in the next election.

    S. In a democracy, the people are the rulers.

    A. SQPR                                  B. QPSR

    C. QSPR                                  D. RSPQ

41. In a reaction turbine the enthalpy drop in a stage is 45 units, the enthalpy drop in moving blades is 23 units. The degree of reaction is _____?

    A. 0.345                                 B. 0.511

    C. 0.682                                 D. 1.386

42. There are two vessels one cylindrical and other cubical of equal height. Both the vessels contain water filled up to brim. If the volume of the cylindrical container is more than that of cubical then according to the hydrostatic paradox. Which is correct statement _____?

    A. pressure at the base of cylindrical container is more than that of cubical.

    B. weight of the cubical container is equal to that of cylindrical container.

    C. pressure at the base of the cylindrical container is equal to that of cubical.

    D. weight of cylindrical container is lesser than that of cubical.

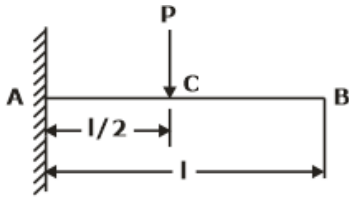43. In the kinematics diagram as shown, find the degree of freedom?

    

    A. 1                                     B. 2

    C. 3                                     D. 4

44. Which of the following is the reason for irreversibility due to friction _____?

    A. Internal irreversibility              B. External irreversibility

    C. Frictional irreversibility            D. Chemical irreversibility

45. In thermal power plants, the deaerator is used mainly to_____

    A. remove air from condenser.            B. increase feed water temperature

    C. reduce steam pressure                 D. remove dissolved gases from feed water,

46. A circular rod of 100 mm diameter and 500 mm length is subjected to a tensile force of 1000kN. Determine the modulus of rigidity (G) _____. If E = $2\times10^5$ N/mm² and Poisson's = 0.3

A. $0.335\times10^5$ N/mm²

B. $0.521\times10^5$ N/mm²

C. $0.769\times10^5$ N/mm²

D. $0.2256\times10^5$ N/mm²

47. The flow in the runner of Francis turbine is characterized by _____flow.

A. Purely radial flow

B. Purely tangential

C. Purely axial

D. Mixed flow of radial and tangential type.

48. For a small scale industry, the fixed cost per month is Rs. 5000/-. The variable cost per product is Rs. 20/- and sales price is Rs. 30/- per piece. The break-even production per month will be _____.

A. 300

B. 460

C. 500

D. 10000

49. A dummy activity is used in PERT network to describe _____.

A. Precedence relationship

B. Necessary time delay

C. Resource restriction

D. Resource idleness

50. Stanton number is given by _____.

A. Nu × Re × Pr

B. $\dfrac{Nu}{Re\times Pr}$

C. $\dfrac{Nu \times Re}{Pr}$

D. $\dfrac{Re\times Pr}{Nu}$

51. If dynamic load capacity of a ball bearing is 30 kN then, maximum radial load it can sustain to operate at 1200 rpm for 3000 hrs is_____.

A. 5 kN

B. 6 kN

C. 8 kN

D. 10 kN

52. The state of stress at a point is given by $\sigma_x$ = 100 MPa and $\sigma_y$ = −50 MPa and $\tau_{xy}$ =100 MPa. The centre of Mohr's circle and its radius will be _____.

A. $\left(\sigma_x = 75\,MPa, \tau_{xy} = 0\right)$ and $75\,MPa$

B. $\left(\sigma_x = 25\,MPa, \tau_{xy} = 0\right)$ and $125\,MPa$

C. $\left(\sigma_x = 25\,MPa, \tau_{xy} = 0\right)$ and $150\,MPa$

D. $\left(\sigma_x = 75\,MPa, \tau_{xy} = 0\right)$ and $125\,MPa$

53. The horizontal and vertical components of a force are 5N and 12N respectively. The force is _____.

A. 23 N

B. 20 N

C. 13 N

D. 7 N

54. While working between temperatures 150 K and 300 K, the entropy change experienced by the Carnot engine during heat addition is 1 kJ/K, the work produced (kJ) by the engine is _____.

    A. 100
    B. 150
    C. 300
    D. 600

55. For the Cantilever beam as shown Below



    Deflection At 'C' will be_____.

    A. $\dfrac{Pl^3}{3EI}$
    B. $\dfrac{Pl^3}{24EI}$

    C. $\dfrac{Pl^3}{8EI}$
    D. $\dfrac{Pl^3}{48EI}$

56. A small ball of mass m is thrown upward with velocity u from the ground. The ball experiences a resistive force $mkv^2$ where v is its speed. The maximum height attained by the ball is:

    A. $\dfrac{1}{2k}\tan^{-1}\dfrac{ku^2}{g}$
    B. $\dfrac{1}{k}\ell n\left(1+\dfrac{ku^2}{2g}\right)$

    C. $\dfrac{1}{k}\tan^{-1}\dfrac{ku^2}{2g}$
    D. $\dfrac{1}{2k}\ell n\left(1+\dfrac{ku^2}{g}\right)$

57. Reaming is the operation of _____.

    A. enlarging the end of a hole cylindrically
    B. cone shaped enlargement of the end of a hole
    C. smoothing and squaring the surface around a hole
    D. sizing and finishing a hole

58. Projection Welding is a_____.

    A. Multi–spot welding process
    B. Arc welding process
    C. Process used for joining round bars
    D. None of these

59. Which one of the following expresses the sensitiveness of a governor_____?

    A. $\dfrac{N_1+N_2}{2N_1 N_2}$
    B. $\dfrac{N_1-N_2}{2N_1 N_2}$

    C. $\dfrac{2(N_1+N_2)}{N_1-N_2}$
    D. $\dfrac{2(N_1-N_2)}{N_1+N_2}$

60. A cyclic heat engine operates between source temperature of 1000 °C and a sink temperature 50 °C. The least rate of heat rejection when net work output is 2 kW is _____.

    A. 2.6799 kW
    B. 0.6799 kW
    C. 0.7463 kW
    D. none of the above

61. A body which is at 400K emits radiation of wavelength 7.24 µm. If the body is heated from a source for 15 minutes & the temperature of the body reaches to 927°C. What will be the wavelength of the radiation emitted by the body _____.

    A. 21.72 µm
    B. 2.41 µm
    C. 7.24 µm
    D. 0.804 µm

62. A diesel engine has a compression ratio of 20 and cut-off takes place at 10% of the stroke. What is the cut-off ratio?

    A. 1.80
    B. 1.85
    C. 1.90
    D. 2.9

63. The process of super-heating in a refrigeration cycle

    A. Does not changes the refrigeration effect
    B. Increases the refrigeration effect
    C. Decreases the refrigeration effect
    D. The refrigeration effect will depend on refrigerant.

64. 'Tempering' of quenched martensite steel is necessary to improve the _____.

    A. hardness of the metal
    B. surface texture of the metal
    C. corrosion resistance of the metal
    D. ductility of the metal

65. An ideal gas with heat capacity ratio of 2 is used in an ideal Otto-cycle which operates between minimum and maximum temperatures of 200 K and 1800 K. What is the compression ratio of the cycle for maximum work output____?

    A. 1.5
    B. 2
    C. 3
    D. 4

66. Which one of the following is the expression of the vorticity component for a 2-D fluid element in x – y plane _____.

    A. $\Omega_z = \dfrac{1}{2}\left(\dfrac{\partial u}{\partial y} - \dfrac{\partial v}{\partial x}\right)$
    B. $\Omega_z = \dfrac{1}{2}\left(\dfrac{\partial v}{\partial x} - \dfrac{\partial u}{\partial y}\right)$
    C. $\Omega_z = \left(\dfrac{\partial v}{\partial x} - \dfrac{\partial u}{\partial y}\right)$
    D. $\Omega_z = \dfrac{\partial u}{\partial y} - \dfrac{\partial v}{\partial x}$

67. The degree of reaction in axial flow compressor is defined as the ratio of static enthalpy rise in the _____.

    A. rotor to static enthalpy rise in the stator
    B. stator to static enthalpy rise in the rotor
    C. rotor to static enthalpy rise in the stage
    D. stator to static enthalpy rise in the stage

68. The natural frequency of an undamped vibrating system is 100 rad/s. The damper has a damping factor 0.8 in the system. The frequency of vibration of damped system, (in rad/s) is _____.

A. 60  
B. 75  
C. 80  
D. 100

69. For the same friction lining material and applied load, what will be the ratio of torque carrying capacity calculated using Uniform pressure theory and Uniform wear theory if clutch plates are solid ($R_i$ = 0) _____.

A. 3/2  
B. 2/3  
C. 4/3  
D. 3/4

70. Reason of flank wear is _____.

A. Abrasion  
B. Diffusion  
C. Adhesion  
D. None of these

ANSWERS

1. Ans. B.
2. Ans. B.
3. Ans. D.
4. Ans. B.
5. Ans. A.
6. Ans. D.
7. Ans. C.
8. Ans. B.
9. Ans. D.
10. Ans. A.
11. Ans. B.
12. Ans. C.
13. Ans. B.
14. Ans. B.
15. Ans. C.
16. Ans. C.
17. Ans. D.
18. Ans. B.
19. Ans. A.
20. Ans. A.
21. Ans. B.
22. Ans. B.

23. Ans. D.

24. Ans. B.

25. Ans. C.

26. Ans. B.

27. Ans. A.

28. Ans. D.

29. Ans. B.

30. Ans. C.

31. Ans. B.

32. Ans. B.

33. Ans. A.

34. Ans. A.

35. Ans. A.

36. Ans. C.

37. Ans. C.

38. Ans. D.

39. Ans. D.

40. Ans. C.

41. Ans. B.

42. Ans. C.

43. Ans. A.

44. Ans. A.

45. Ans. D.

46. Ans. C.

47. Ans. D.

48. Ans. C.

49. Ans. A.

50. Ans. B.

51. Ans. A.

52. Ans. B.

53. Ans. C.

54. Ans. B.

55. Ans. B.

56. Ans. D.

57. Ans. D.

58. Ans. A.

59. Ans. D.

60. Ans. B.

61. Ans. B.

62. Ans. D.

63. Ans. B.

64. Ans. D.

65. Ans. C.

66. Ans. C.

67. Ans. C.

68. Ans. A.

69. Ans. C.

70. Ans. A.

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