

LET - DIP

Question Booklet Version :

A

Qn. Booklet No. : **25015**

Roll Number :

--	--	--	--	--	--	--	--	--	--

## INSTRUCTIONS TO CANDIDATES

1. Fill in the OMR sheet carefully as per the instructions given on the back of the OMR Sheet / Admit Card. OMR sheet not correctly filled in will not be valued.
2. Write your Roll Number (all eight digits) and Version as A on the Question Booklet and on the left hand side of the OMR sheet (basic data part).
3. The examination consists of 120 Objective type multiple choice questions, which are to be answered in 120 minutes.
4. After opening the Question Booklet ensure that there are 120 Questions and that the printing of all the questions are legible. If there are any missing or illegibly printed questions, the matter may be reported to the Invigilator immediately
5. There are 4 options (A, B, C & D) for each objective type question. Mark the most appropriate answer to each question by blackening fully the corresponding bubble in the OMR sheet with a black/blue ink ball point pen. **For every correct answer 1 mark will be awarded. No deduction of mark will be made for incorrect answer and unanswered questions.** Marking of more than one bubble against a question number in the OMR sheet shall be considered as an incorrect answer. Erasing, overwriting, partial marking, etc. shall also be treated as incorrect answer.
6. Rough work and calculations can be made in the blank pages attached to the question booklet. Watch, Calculator, Mobile phone, Electronic instruments etc. shall not be allowed in the examination hall.
7. The OMR Sheet and the Hall Ticket should be returned to the Invigilator. The Counterfoil of the Hall Ticket and Question Booklet can be retained by the candidate after the examination.
8. Answer keys will be published on the website [www.lbscentre.kerala.gov.in](http://www.lbscentre.kerala.gov.in) after the examination. Complaints, if any, from the candidates regarding the questions, responses / probable answer may be sent to the Email id [lbscentre@gmail.com](mailto:lbscentre@gmail.com) within 24 hours from the time of publication of the answer keys. Complaints not substantiated with supporting documents will not be considered. However the decision of the experts regarding such complaints on the answer keys shall be final.
9. The Answer sheet of candidates who indulge in malpractice in any form shall not be valued.
10. The candidates will be allowed to leave the hall only after the completion of the examination time and after handing over the Answer sheet to the Invigilator.

SEAL

1. One of the major disciplines of civil engineering, which encompasses water and air quality management is:  
A) Water resources engineering                      B) Transportation engineering  
C) Environmental engineering                         D) Geotechnical engineering
  
2. Relatively undisturbed coastal areas in a country belongs to:  
A) CRZ-III                                                 B) CRZ-I  
C) CRZ-II                                                 D) CRZ-IV
  
3. Floor area ratio is the ratio of \_\_\_\_\_ of a building to the area of the land upon which the building is built.  
A) Plinth area                                            B) Gross floor area  
C) Carpet area                                          D) Built up area
  
4. Plane survey is carried out when the area of the land is typically less than:  
A) 200 km<sup>2</sup>                                                B) 150 km<sup>2</sup>  
C) 250 km<sup>2</sup>                                                D) 300 km<sup>2</sup>
  
5. An imaginary line joining points of equal elevation on the surface of the earth is:  
A) Level line                                             B) Contour surface  
C) Horizontal line                                      D) Contour line
  
6. Gypsum in cement is to:  
A) Accelerate initial setting time                 B) Impart strength  
C) Increase workability                              D) Retard initial setting time
  
7. Rapid hardening cement has high percentage of:  
A) Lime                                                    B) Silica  
C) Alumina                                              D) Sulphur

8. Flemish bond is a type of bond in which the masonry contains:
- A) Stretchers are laid in every course
  - B) Headers and stretchers are laid in alternate courses
  - C) Headers are laid in every course
  - D) Headers and stretchers are laid alternately in the same course
9. A type of roof truss typically provided with a central vertical post, which supports two sloping rafters and a tie beam, forming a triangular shape is known as:
- A) Queen post truss
  - B) Pratt truss
  - C) Bow string truss
  - D) King post truss
10. The footing continuously provided to support the load bearing walls is:
- A) Strap footing
  - B) Strip footing
  - C) Simple footing
  - D) Single footing
11. Weight per meter of 16 mm diameter reinforcement bar is:
- A) 1.31 kg
  - B) 2.37 kg
  - C) 1.58 kg
  - D) 2.13 kg
12. Bottom surface of an arch is:
- A) Ceiling
  - B) Soffit
  - C) Frog
  - D) Sill
13. The portion of a building in between the ground level and floor level is:
- A) Lintel
  - B) Soffit
  - C) Sill
  - D) Plinth
14. A sloping surface that connects two different levels providing a way to move between them :
- A) Stair
  - B) Ramp
  - C) Soffit
  - D) Mezzanine floor
15. Cracks which partly or completely separate the fibres of wood is:
- A) Shakes
  - B) Heart rot
  - C) Knots
  - D) Rind galls
16. In Otto Cycle, the compression and expansion process are theoretically modelled as \_\_\_\_\_ Process.
- A) Isothermal
  - B) Isobaric
  - C) Isochoric
  - D) Adiabatic

17. How is the heat added in a Diesel Cycle?
- A) Reversibly at constant pressure      B) Irreversibly at constant pressure  
C) Reversibly at constant volume      D) Irreversibly at constant volume
18. In a Four Stroke Engine, working cycle is completed in \_\_\_\_\_ revolution/s of crankshaft.
- A) One      B) Two  
C) Three      D) Four
19. The lubricating oil is circulated in an IC engine by:
- A) Positive displacement pump      B) Roots blower  
C) Natural circulation thermosiphon      D) Centrifugal Pump
20. In MPFI electronic control system, which sensor sends information about the engine speed?
- A) Speed      B) Ignition  
C) Air-flow      D) Air-mass
21. In a reversed Carnot cycle COP is 4. The ratio of highest and lowest temperature is:
- A) 2.5      B) 1.25  
C) 2      D) 1.5
22. The vertical and uniformly space lines on a psychometric chart indicate:
- A) Relative humidity      B) Dry bulb temperature  
C) Specific humidity      D) Wet bulb temperature
23. Gear having straight parallel teeth is:
- A) Helical gear      B) Spur gear  
C) Worm gear      D) Bevel gear
24. A Kaplan turbine is an example of:
- A) Mixed flow turbine      B) Tangential flow turbine  
C) Radial flow turbine      D) Axial flow turbine
25. Rotatory dampers are designed in clutch plates to reduce:
- A) Friction between fly wheel and clutch  
B) Vehicle speed  
C) Jerky starts  
D) Vibration transferred to the wheel



35. RMS value of a sinusoidal waveform is:
- A) Peak value  $\times 0.707$                       B) Peak value  $\times 1.414$   
 C) Peak value / 2                              D) Twice the peak value
36. What is the power factor of a purely resistive AC circuit?
- A) 0                                              B) 1  
 C) 0.5                                          D)  $\sqrt{3}$
37. In a purely capacitive circuit, the current:
- A) Lags the voltage                          B) Leads the voltage  
 C) Is in phase with voltage                  D) Is zero
38. The value of the coefficient of coupling (K) lies between:
- A) 0 to 5                                      B) 1 to 100  
 C) -1 to 1                                      D) 0 to 1
39. Permeance is the reciprocal of:
- A) Reluctance                                  B) Inductance  
 C) Permeability                                D) Flux
40. According to Faraday's law, an EMF is induced when:
- A) A resistor is heated                      B) There is a change in magnetic flux  
 C) The circuit is open                        D) A magnetic field is constant
41. The power factor is defined as:
- A) kVA / kW                                  B) kW / kVAR  
 C) kVAR / kVA                                D) kW / kVA
42. Active power in AC circuit is measured in:
- A) Volt-amperes (VA)                        B) Volt-amperes reactive (VAR)  
 C) Watts (W)                                  D) None of the above
43. An alternating voltage is given by  $v = 200 \sin 314 t$ . Its frequency will be:
- A) 60 Hz                                      B) 50 Hz  
 C) 25 Hz                                        D) 100 Hz
44. A balanced delta resistor network has three resistors, each of resistance R. What is the resistance of each branch in the equivalent star network?
- A) 3R                                            B) R/3  
 C) R                                              D) R/6

45. In a delta connection, the line voltage is:
- A) Equal to the phase voltage                      B)  $\sqrt{3}$  times the phase voltage  
 C) Half of the phase voltage                      D)  $1/\sqrt{3}$  times the phase voltage
46. What is the colour coding for 47 K ohms 5% tolerance resistor?
- A) Yellow, Blue, Red, Gold                      B) Yellow, Violet, Red, Gold  
 C) Yellow, Violet, Orange, Gold                      D) Yellow, Blue, Orange, Gold
47. What is the relationship between Emitter Current ( $I_E$ ), Base Current ( $I_B$ ) and Collector Current ( $I_C$ ) in a BJT?
- A)  $I_E = I_C + I_B$                       B)  $I_B = I_C + I_E$   
 C)  $I_C = I_B + I_E$                       D)  $I_B = I_C = I_E$
48. In Amplitude Modulation with a message signal having the maximum frequency  $f_m$ , the bandwidth of amplitude modulated signal is:
- A)  $f_m$                       B)  $2f_m$   
 C)  $f_m/2$                       D) 0
49. The Intermediate Frequency (IF) commonly used in FM radio receivers is:
- A) 10.7 MHz                      B) 10.7 KHz  
 C) 10.8 MHz                      D) 10.8 KHz
50. The device which converts sound signals to electrical signal is called:
- A) Speaker                      B) Mixer  
 C) Amplifier                      D) Microphone
51. Which of the following is **not** a data indicating or data presentation device in an electronic instrumentation system?
- A) Transducer                      B) Display  
 C) Buzzer                      D) Digital recorder
52. The maximum negative voltage that a diode can withstand is called:
- A) Barrier Potential                      B) Peak Inverse Voltage  
 C) Threshold Voltage                      D) RMS Voltage
53. The value of the current through the diode till the threshold voltage is:
- A) zero                      B) 100 mA  
 C) 1 A                      D) infinity



63. What is the output of the following program?

```
#include <stdio.h>
int main() {
    int a=0, b=1;
    if (0)
        printf("1");
    else
        printf("0");
    return 0;
}
```

- A) 1  
B) 0  
C) 10  
D) Error

64. Which of the following is a keyword in C language ?

- A) goto  
B) signed  
C) enum  
D) All of these

65. What is the output of the following program?

```
#include <stdio.h>
int main() {
    int i;
    for(i=1;i<10;i++);
    printf("%d", i);
    return 0;
}
```

- A) 10  
B) 11  
C) 12  
D) Error

66. Bubble sort can be used to:

- A) Sort the elements in ascending order  
B) Sort the elements in descending order  
C) Both (A) and (B)  
D) Search the elements in ascending and descending order

67. strcpy() is used to:

- A) Find the length of a string  
B) Reverse the given string  
C) Concatenate two strings  
D) None of the above

68. Formal and actual parameters in a function:
- A) Should be same name
  - B) Should be a string
  - C) Both (A) and (B)
  - D) None of the above

69. What is the output of the following program?

```
#include <stdio.h>
#include <string.h>
int main() {
    char str1[] = "11";
    char str2[] = "00";
    strcat(str1, str2);
    printf("%s", str1);
    return 0;
}
```

- A) 1100
- B) 0011
- C) 1010
- D) None of these

70. Maximum size of array in C language depends on:

- A) Data type size
- B) Memory
- C) Both (A) and (B)
- D) None of these

71. What is the output of the following program?

```
#include <stdio.h>
int main() {
    int matrix[3][3] = {
        {1, 2, 3},
        {4, 5, 6},
        {7, 8, 9}
    };
    int i, s=0;
    for (i = 0; i < 3; i++)
        s += matrix[i][i];
    printf(" %d", s);
}
```

- A) 15
- B) 6
- C) 12
- D) 18

72. Which of the following is a pointer declaration variable in C language?

- A) \*
- B) &
- C) Both (A) and (B)
- D) None of these



79. A principal plane is a plane which:
- A) Carries only normal stress and no shear stress
  - B) Carries maximum shear stress
  - C) Has an inclination of  $45^\circ$  to x-axis
  - D) Is parallel to x-axis
80. Limiting force of friction is the frictional force when the body:
- A) Is moving with maximum velocity
  - B) Is stationary
  - C) Just begins to move
  - D) Is accelerating
81. Isotropic means:
- A) Having same elastic properties in all directions
  - B) Has Young's modulus equal to Modulus of Rigidity
  - C) Obeys Hooke's law upto failure
  - D) Very strong and durable
82. Mass moment of inertia of a body can be considered as the measure of resistance to:
- A) Rotation
  - B) Bending
  - C) Motion
  - D) Abrasion
83. The forces which meet at a point are known as:
- A) Collinear forces
  - B) Concurrent forces
  - C) Coplanar forces
  - D) None of these
84. The centre of gravity of a right angled triangle of height  $h$  is at a height of \_\_\_\_\_ from base.
- A)  $h/4$
  - B)  $h/2$
  - C)  $h/3$
  - D)  $2h/3$
85. Angle of repose is:
- A) Less than angle of friction
  - B) Equal to angle of friction
  - C) More than angle of friction
  - D) None of these
86. The centre of gravity of a solid hemisphere lies along the central radius at a distance of \_\_\_\_\_ from the plane base.
- A)  $3r/4$
  - B)  $3r/8$
  - C)  $8r/3$
  - D)  $7r/3$

87. "The moment of a force about an axis is equal to the sum of the moments of its components about the same axis" is the statement of:

- A) Lami's theorem  
 B) Varignon's theorem  
 C) Newton's Law  
 D) D'Alembert's Principle

88. The component of a force P at right angles to its direction is:

- A) Zero  
 B) Half  
 C) Same  
 D) 1.414 P

89. The product of mass and velocity is known as:

- A) Power  
 B) Momentum  
 C) Impulse  
 D) Work

90. The unit of angular displacement is:

- A) radians  
 B) radians per second  
 C) radians per second<sup>2</sup>  
 D)  $\pi$

91. The rank of the matrix  $\begin{bmatrix} 0 & 0 & 5 \\ 3 & 5 & 0 \\ 5 & 0 & 0 \end{bmatrix}$

- A) 3  
 B) 2  
 C) 1  
 D) 0

92. The value of  $\lambda$  for which the system of equations  $3x + y - \lambda z = 0$ ,  $4x - 2y - 3z = 0$ ,  $2\lambda x + 4y + \lambda z = 0$  possess non-trivial solutions is:

- A) -1  
 B) -9  
 C) 2  
 D) 9

93. If 2 is an eigen value of  $A = \begin{bmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{bmatrix}$  then the eigen values of  $A^{-1}$  are:

- A)  $\frac{1}{2}, 3, 6$   
 B)  $-\frac{1}{2}, -3, -6$   
 C)  $\frac{1}{2}, \frac{1}{3}, \frac{1}{6}$   
 D) cannot be determined

94. The symmetric matrix associated with the quadratic form  $-11x_1^2 + 84x_1x_2 + 24x_2^2$  is:

- A)  $\begin{bmatrix} -11 & 42 \\ 42 & 24 \end{bmatrix}$   
 B)  $\begin{bmatrix} 11 & -42 \\ -42 & -24 \end{bmatrix}$   
 C)  $\begin{bmatrix} -11 & 40 \\ 44 & 24 \end{bmatrix}$   
 D)  $\begin{bmatrix} 42 & -11 \\ -11 & 42 \end{bmatrix}$







Questions (115-120). Answer the questions/fill in the blanks, choosing the most appropriate of the options provided:

115. Don't mock \_\_\_\_\_ beggars!
- A) for  
B) at  
C) against  
D) on
116. He opened the \_\_\_\_\_ for the old man.
- A) car door  
B) car's door  
C) the door of a car  
D) the door in a car
117. I'm going \_\_\_\_\_ home.
- A) to  
B) off  
C) up  
D) (No word required)
118. Pick the wrongly spelt word:
- A) arduous  
B) virtuous  
C) bulbous  
D) calcalus
119. Rearrange the words in the logical order of a sentence:
- After in a the she person was named locality prominent
- 1 2 3 4 5 6 7 8 9 10
- A) 4 6 7 3 10 2 9 8 1 5  
B) 5 7 3 6 8 2 4 10 9 1  
C) 5 7 8 1 3 10 6 2 4 9  
D) 3 10 6 2 4 9 7 1 8 5
120. The imperative 'Girl, open your bag!' may best be reported as:
- A) "Open your bag!" was ordered.  
B) She was ordered to open her bag.  
C) She was ordered to open her bag at them.  
D) She was ordered to open her bag by them.