aglasem.com

FOR KARNATAKA CLASS 10 PREPARATION

Karnataka SSLC Model Question Paper 2027 for Elements Of Mechanical Engineering IV (Paper 2) Key Answers

EXAM	YEAR	TYPE
Karnataka Class 10	2027	Answer Key

52

ಕರ್ನಾಟಕ ಶಾಲಾ ಪರೀಕ್ಷೆ ಮತ್ತು ಮೌಲ್ಯನಿರ್ಣಯ ಮಂಡಲಿ.

6 ನೇ ಅಡ್ಡ ರಸ್ತೆ, ಮಲ್ಲೇಶ್ವರಂ, ಬೆಂಗಳೂರು – 560003

KARNATAKA SCHOOL EXAMINATION AND ASSESSMENT BOARD.

6 th Cross, Malleshwaram Bengaluru-560003

2026-27 ರ ಎಸ್, ಎಸ್, ಎಲ್, ಸಿ. ಮಾದರಿ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ –2

ಮಾದರಿ ಉತ್ತರಗಳು

MODEL ANSWER

OF S S L C MODEL QUESTION PAPER-2:2026-27

ವಿಷಯ : ಎಲಿಮೆಂಟ್ಸ್ ಆಫ್ ಮೆಕ್ಯಾನಿಕಲ್ ಇಂಜಿನಿಯರಿಂಗ್ -IV

Subject: ELEMENTS OF MECHANICAL ENGINEERING –IV

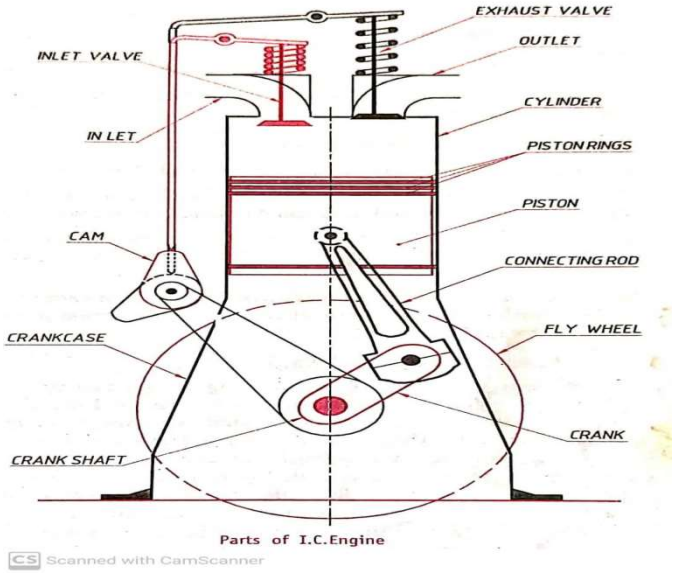
ವಿಷಯ ಸಂಕೇತ : **52** ಗರಿಷ್ಠ ಅಂಕ : **80**

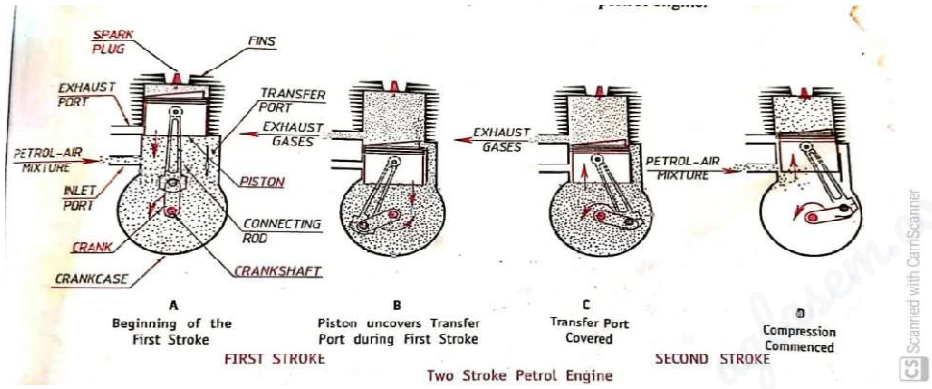
SUBJECT CODE: 52 **MAXIMUM MARKS:80**

Qn. Nos.	Value Points	Total
I	**Four alternatives are given for each of the following questions / incomplete statements. Select the most appropriate alternative and write it in the answer book along with its alphabet.**	
1	Compression ratio of diesel engine is (A) 8:1 to 10:1 (B) 15:1 to 10:1 (C) 16:1 to 20:1 (D) 10:1 to 15:1 **Ans: (C) 16:1 to 20:1**	1

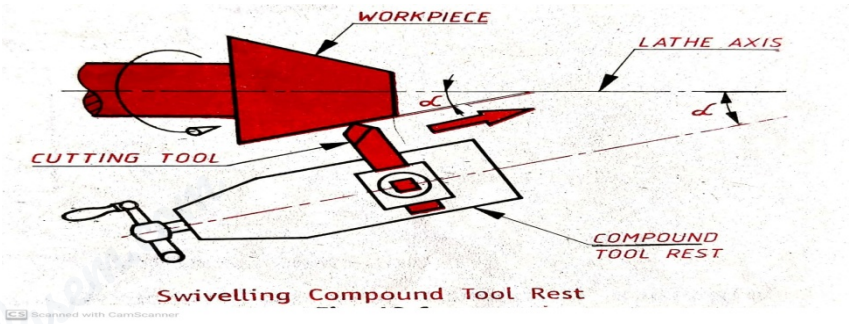
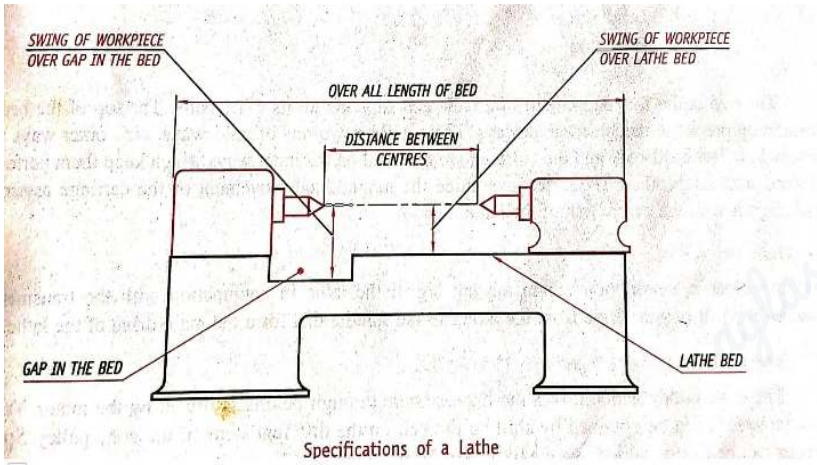
2	The inner diameter of engine cylinder is called is: (A) Bore (B) Stroke (C) Clearance (D) Pitch **Ans: (A) Bore**	**1**
3	Spark plug is used in: (A) Petrol engine (B) Diesel engine (C) Electric Engine (D) Steam engine **Ans: (A) Petrol engine**	**1**
4	The operation of producing flat surface on drilled hole is called: (A)Drilling (B) Spot facing (C) Tapping (D) Boring **Ans: (B) Spot facing**	**1**
5	Embossing a diamond shaped pattern on the surface of workpiece is called: (A) Taper turning (B) Plain turning (C) Knurling (D) Grooving **Ans: (C) Knurling**	**1**
6	The dimension lines are: (A) Thin line (B) Thick line (C) Dashed line (D) Zig-Zag line **Ans: (A) Thin line**	**1**
7	The projection on HP is: (A) Front view (B) Left side view (C) Right side view (D) Top view **Ans: (D) Top view**	**1**

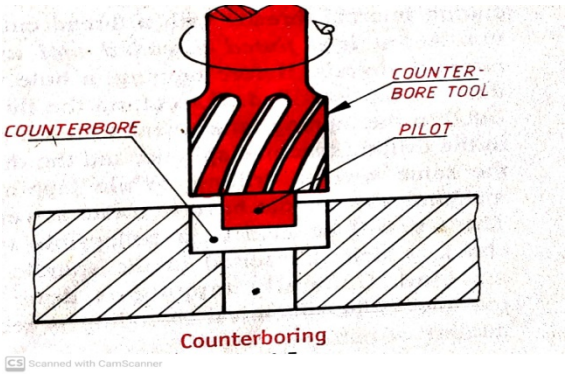
8	If the top view of a plane is rhombus, the object may be: (A) Square (B) Parallelogram (C) Octagon (D) Rectangle **Ans: (A) Square**	**1**
9	A solid having minimum number of faces is: (A) Square Pyramid (B) Triangular prism (C) Cube (D) Tetrahedron **Ans: (D) Tetrahedron**	**1**
10	The hidden part in a drawing is shown as: (A) Thick line (B) Thin line (C) Dashed line (D) Zig-zag line **Ans: (C) Dashed line**	**1**
II	**Answer the following questions**	
11(A)	(a) Define the following. (i) TDC (ii) BDC **Ans:** **i) TDC:** The extreme position of the piston towards the cover end of the cylinder. **ii) BDC :** The extreme position of the piston towards the crank end of the cylinder.	**1+1**

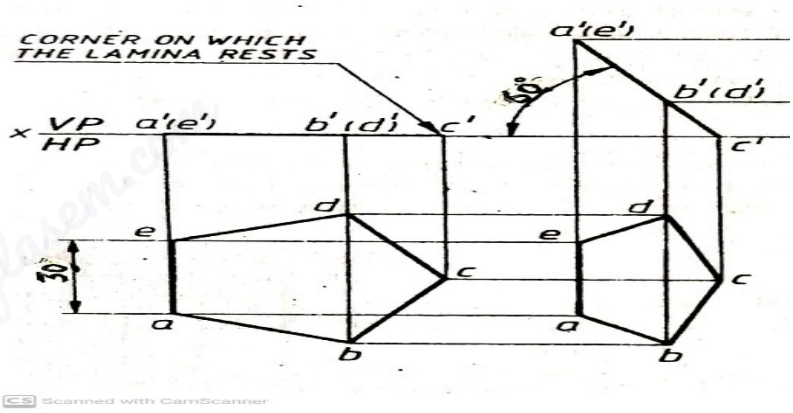
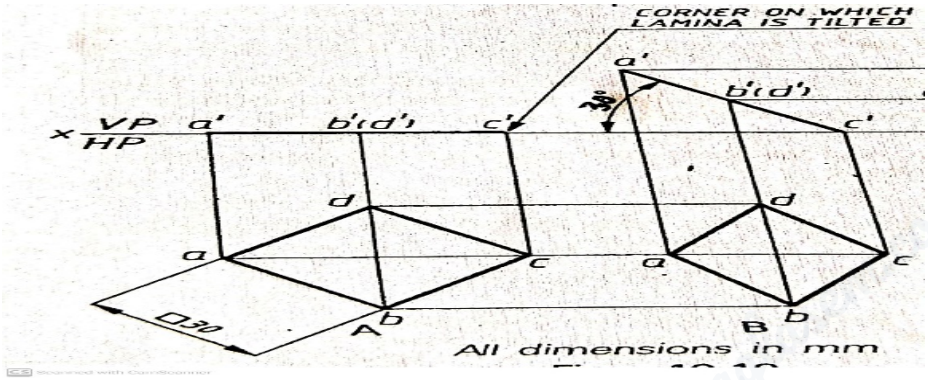
B)	Name the types of I. C. engine on the following bases. 1.Types of fuel used 2.Number of strokes 3.method of cooling **Ans:** (i) Types of fuel used 1. Petrol engine 2. Diesel engine 3. Gas engine 4. Bi-fuel engine (ii) Number of strokes 1. Two stroke engine 2. four stroke engine (iii) Method of cooling 1. Air cooled engine 2.Water cooled engine	**1+1+1**
C)	Draw the neat sketch of I. C. engine and label the parts. **Ans:**  Parts of I.C.Engine Scanned with CamScanner	**3+2**

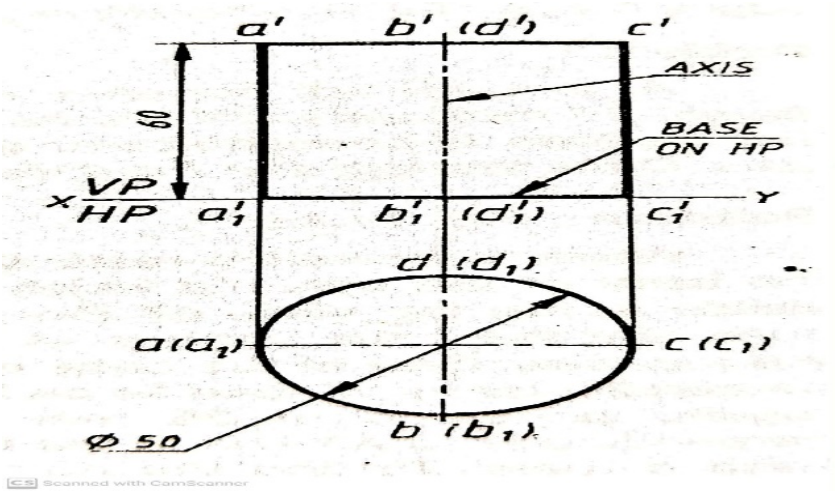
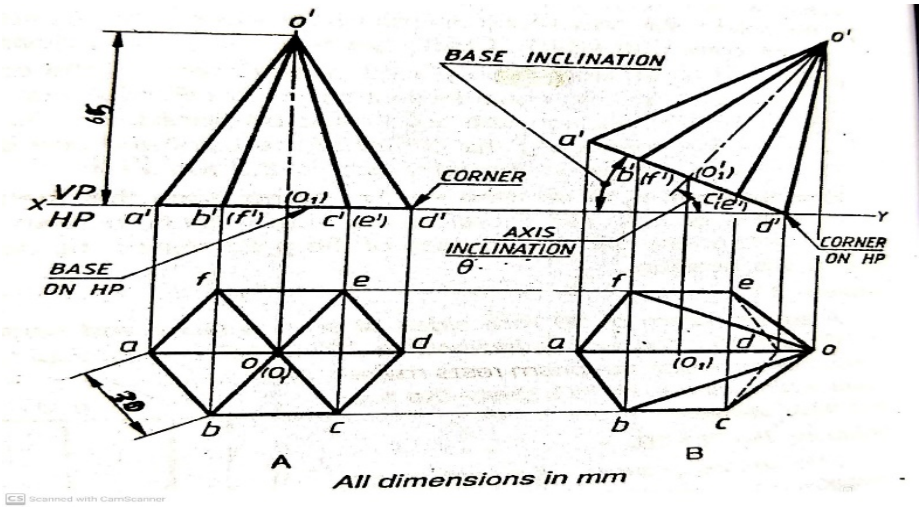
12 (a)	Write any two applications of I. C. Engine **Ans:** 1.Automobile industries 2. Power generation 3. Marine industries 4. Aircraft industries	**2**
B)	Classify the different types of drilling machine. **Ans:** 1. Portable drilling machine 2. Sensitive drilling machine (Bench type) 3. Pillar/Upright drilling machine 4. Radial drilling machine 5. Gang drilling machine 6. Multiple spindle drilling machine	**3**
C)	Explain with a neat diagram a two-stroke petrol I. C. Engine. **Ans:**  	**5**

	1st Stroke [Downward Stroke]:- *At the beginning of the first stroke, the piston is at the cover end. It moves from the cover end to the crank end. *The spark plug ignites the compressed petrol and air mixture. The high-pressure burnt gases force the piston downward. *The piston performs the power stroke until it uncovers the exhaust port, developed power is thus released. *The burnt gases, which are at a pressure stage higher than atmospheric pressure, pass through the exhaust port. * As soon as the top edge of the piston uncovers the transfer port, the fresh air-fuel mixture flows from the crankcase into the cylinder. *The fresh air-fuel mixture entering the cylinder drives out the burnt gases through the exhaust port. This process of driving out the exhaust gases by the incoming fresh charge is called scavenging. *This will continue until the piston covers both the exhaust and transfer ports during the next stroke. *The crankshaft rotation completes a half-rotation 2nd Stroke (Upward Stroke) *In this stroke, the piston moves from the crank end to the cover end. *When the piston covers the transfer port, the supply of air-fuel mixture stops. As it moves farther up, it covers the exhaust port completely, stopping the scavenging process. *Further, the piston will compress the air-fuel mixture inside the cylinder. *The compression ratio is 7:1 to 11:1. * After the piston reaches the cover end, the cycle repeats again. *The crankshaft rotation is a half rotation	
13 A)	List the different types of operations performed on lathe. **Ans:** Operations performed on Lathe: Plain turning, Step turning, Taper turning, Facing, Knurling, Thread cutting, Grooving, Parting-off, Drilling, And Boring.	**2**

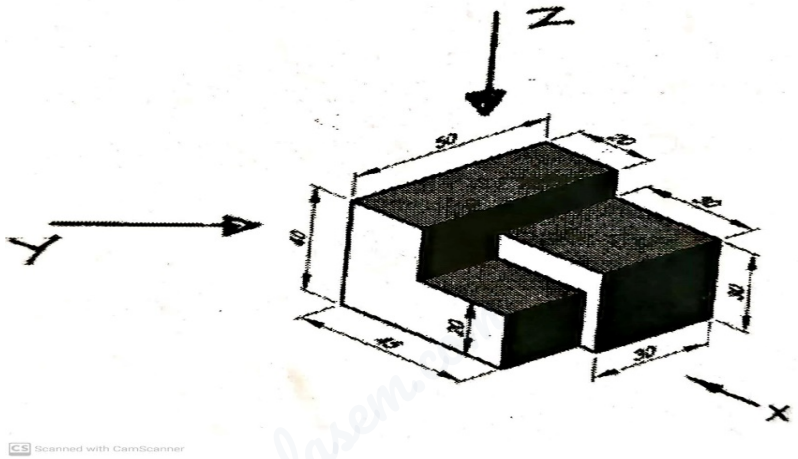
B)	Explain Knurling operation carried out on the lathe machine. **Ans:**  Swivelling Compound Tool Rest This method of taper turning shown in Figure is more suitable for workpieces which require steep taper for short lengths. The compound tool rest is swiveled to the required taper angle and then locked in position. The carriage is also locked at that position. For taper turning, the compound tool rest is moved linearly at an angle so that the cutting tool produces the tapered surface on the workpiece. This method is limited to short tapered lengths due to the limited movement of the compound tool rest.	**3**
C)	With neat sketch explain lathe specifications **Ans:**  Specifications of a Lathe	**5**

	Lathe specifications 1. Maximum diameter of the workpiece that can be revolved over the lathe bed. Instead of this sometimes, the height of the centre above the lathe bed is also specified. One of these specifications is given by the manufacturers; however both of them are loosely called as "Swing of the lathe". 2. The Maximum diameter and the width of the workpiece that can swing when the lathe has a gap bed. 3. The maximum length of the workpiece that can be mounted between the centres. 4. Overall length of the bed.	
14 A)	List different operations performed on drilling machine and explain Counterboring operation. **Ans:** Operations on Drilling Machine: Drilling, Reaming, Boring, Counterboring, Countersinking, Tapping, Spot facing. Counterboring operation:  Counterboring is to increase the size of a hole at one end only through a small depth as shown in Figure. The counterboring forms a larger sized recess or a shoulder to the existing hole. The cutting tool will have a pilot to guide the tool while counterboring. The size of the pilot will always be equal to the size of the initially drilled hole. Interchangeable pilots of different sizes are also used for counterboring holes of different diameters. The speeds for counterboring must be two-thirds of the drilling speed the corresponding size of the drilled hole.	**2+3**

B)	A pentagonal plane lamina of side 30mm is resting on HP with one of its corners touching it such that the plane surface makes an angle of 60° with HP. Draw the top and front views of the plane. **Ans:**  	**5**
15 A)	A square lamina ABCD of 30mm side rests on the corner C such that the diagonal AC appears as at 30° to HP. Draw its front and top views. **Ans:**  	**5**

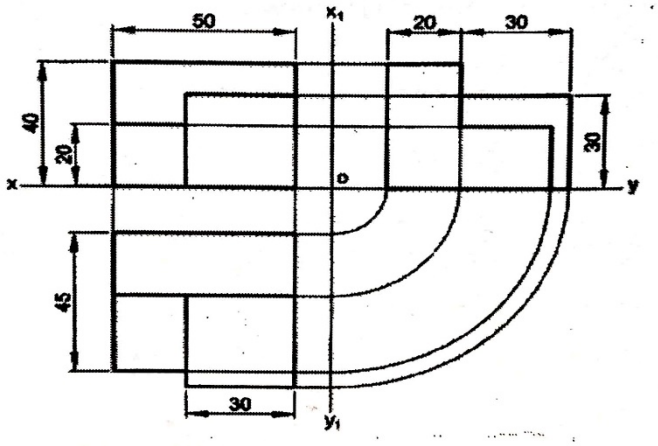
B)	Draw the projection of a cylinder of 50mm diameter of base and height 60mm resting with its base on HP. **Ans:**  	**5**
16	A hexagonal pyramid of 30mm edge of base and height 65mm rests with one of its corners of the base on HP such that the base is inclined at 30° to it and the axis parallel to VP. Draw its projections **Ans:**  	**10**

17	The pictorial view of an object is shown in figure No.1. Draw the following orthographic views and make the dimensions. 1. Front view: looking in direction of arrow 'X' 2. Top view: looking in direction of arrow 'Z' 3. Side view: looking in direction of arrow 'Y'	**10**

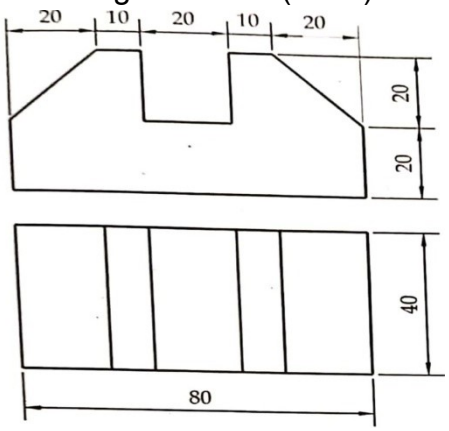
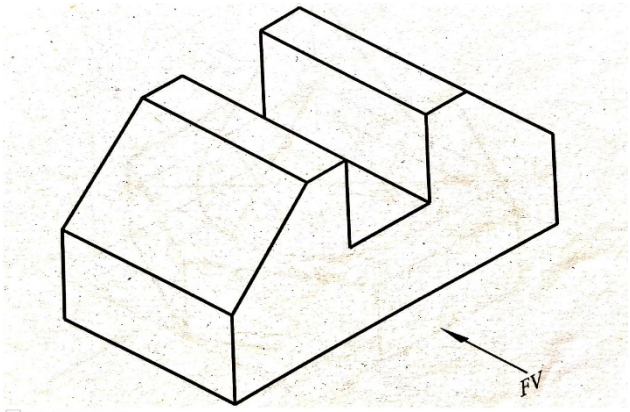


Scanned with CamScanner

Ans:



Scanned with CamScanner

OR	Draw the isometric views of an object from the given orthographic views in Figure No. 2. (10 m)  Figure No. 2 **Ans:**  	**10**