



CCE RF/RR

ಕರ್ನಾಟಕ ಶಾಲಾ ಪರೀಕ್ಷೆ ಮತ್ತು ಮೌಲ್ಯನಿರ್ಣಯ ಮಂಡಲಿ, ಮಲ್ಲೇಶ್ವರಂ, ಬೆಂಗಳೂರು - 560 003
**KARNATAKA SCHOOL EXAMINATION AND ASSESSMENT BOARD,
MALLESHWARAM, BENGALURU - 560 003**

ಮಾರ್ಚ್/ಏಪ್ರಿಲ್ 2025 ರ ಪರೀಕ್ಷೆ-1
MARCH/APRIL 2025 EXAMINATION-1

ಮಾದರಿ ಉತ್ತರಗಳು
MODEL ANSWERS

ಸಂಕೇತ ಸಂಖ್ಯೆ : **52**

CODE NO. : **52**

ವಿಷಯ : ಎಲಿಮೆಂಟ್ಸ್ ಆಫ್ ಮೆಕ್ಯಾನಿಕಲ್ ಇಂಜಿನಿಯರಿಂಗ್ - IV

Subject : **ELEMENTS OF MECHANICAL ENGINEERING - IV**

(ಶಾಲಾ ಅಭ್ಯರ್ಥಿ / ಶಾಲಾ ಪುನರಾವರ್ತಿತ ಅಭ್ಯರ್ಥಿ)

(Regular Fresh / Regular Repeater)

ದಿನಾಂಕ : 01. 04. 2025]

[ಗರಿಷ್ಠ ಅಂಕಗಳು : 80

Date : 01. 04. 2025]

[Max. Marks : 80



Qn. Nos.	Value Points	Total
1.	Rectilinear motion is converted into rotary motion with the help of (A) valves and piston (B) crank and connecting rod (C) connecting rod and piston (D) crank and piston Ans. (B) crank and connecting rod	1
2.	Four stroke sequence of operation is (A) suction, exhaust, compression and power (B) suction, power, exhaust and compression (C) suction, compression, power and exhaust (D) suction, compression, exhaust & power Ans. (C) suction, compression, power and exhaust	1

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[Turn over

Qn. Nos.	Value Points	Total
3.	A diesel engine has (A) one valve (B) four valves (C) three valves (D) two valves Ans. (D) two valves	1
4.	Mother of all machine tools is (A) Milling machine (B) Lathe (C) Grinding machine (D) Drilling machine Ans. (B) Lathe	1
5.	Process of enlarging the hole size is known as (A) Spot facing (B) Drilling (C) Reaming (D) Boring Ans. (D) Boring	1
6.	A plane has (A) three dimensions (B) four dimensions (C) two dimensions (D) one dimension Ans. (C) two dimensions	1
7.	If a circular plane is inclined at 30° with the H.P. and 60° with the V.P., its side view will be (A) Ellipse (B) Straight line (C) Circle (D) True shape Ans. (B) Straight line	1
8.	If the top view of a plane is a rhombus, the object may be (A) Square (B) Parallelogram (C) Octagon (D) Rectangle Ans. (A) Square	1

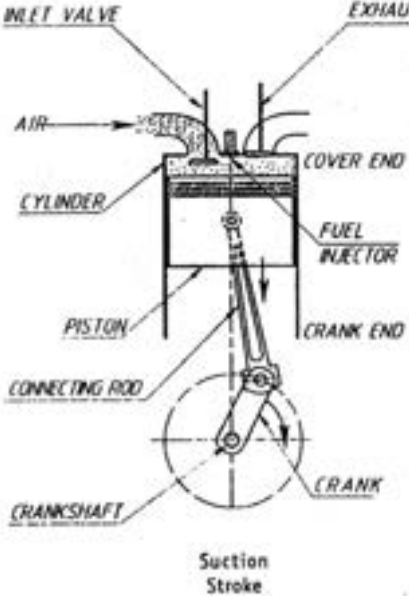


Qn. Nos.	Value Points	Total
9.	A solid has (A) one dimension (B) three dimensions (C) two dimensions (D) four dimensions <i>Ans.</i> (B) three dimensions	1
10.	The projectors in isometric views are (A) converging (B) diverging (C) parallel to plane of projection (D) perpendicular to plane of projection <i>Ans.</i> (D) perpendicular to plane of projection	1
11. a)	Write the types of I.C. engines on the basis of method of cooling. <i>Ans.</i> Following are the two types : i) Air cooled engines ii) Water cooled engines	2
b)	Explain any three parts of I.C. engine. <i>Ans.</i> i) <u>Cylinder</u> : The heart of the engine is the cylinder in which fuel is burnt and power is developed ii) <u>Piston</u> : The piston is a close fitting hollow-cylindrical plough moving to and fro in the cylinder. iii) <u>Connecting rod</u> : It is a link that connects the piston and the crank-shaft by means of pin joints. It converts the rectilinear motion of the piston into rotary motion of the crank shaft.	3

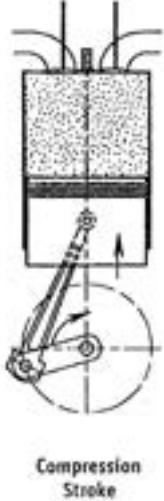
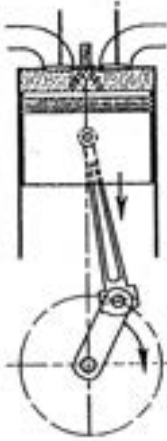


Qn. Nos.	Value Points			Total	
c)	Write the comparison between four-stroke and two-stroke I.C. engines.			5	
	<i>Ans.</i>				
	Sl. No.	Principle	Four-stroke		Two-stroke
	i)	Number of strokes per cycle	Requires four strokes of the piston of complete one cycle of operation		Requires only two strokes of the piston to complete one cycle of operation
	ii)	Power	Power developed in every alternative revolution of the crank shaft		Power is developed in every revolution of the crank shaft
	iii)	Fly wheel	Heavy fly wheel is required		Lighter fly wheel is required
	iv)	Valves	Inlet and outlet valves are opened and closed by mechanical valves		The piston itself opens and closes
	v)	Engine cooling	More effective		Very high effective
	vi)	Lubrication oil consumption	Less	More	
	vii)	Noise	Less	More	
12. a)	Explain E.C. engines and I.C. engines.			2	
	<i>Ans.</i>				
	<p><u>E.C. engines</u> : Means external combustion engines. Fuel combustion takes place outside the engine cylinder.</p> <p><u>I.C. engines</u> : Means internal combustion engines. Fuel combustion takes place inside the engine cylinder.</p>				

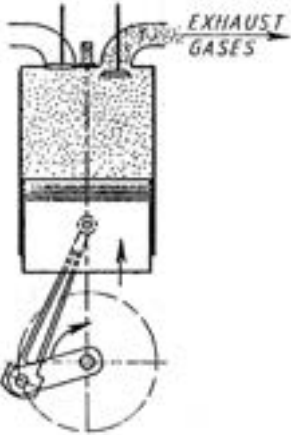


Qn. Nos.	Value Points	Total
b) c)	<p>Classify the different types of lathe.</p> <p><i>Ans.</i></p> <ol style="list-style-type: none"> i) Speed lathe ii) Bench lathe iii) Tool room lathe iv) Engine lathe v) Capstan and turret lathe vi) Automatic lathe <p>Explain with a neat diagram a four-stroke diesel I.C. engine.</p> <p><i>Ans.</i></p> <p>Following are the four-strokes :</p> <ol style="list-style-type: none"> i) Suction stroke ii) Compression stroke iii) Power stroke iv) Exhaust stroke <p>i) <u>Suction stroke</u></p>  <ul style="list-style-type: none"> • During this stroke piston is moving from T.D.C. to B.D.C. • Inlet valve is opened and outlet valve is closed • Through inlet valve only pure air is coming into the cylinder 	3

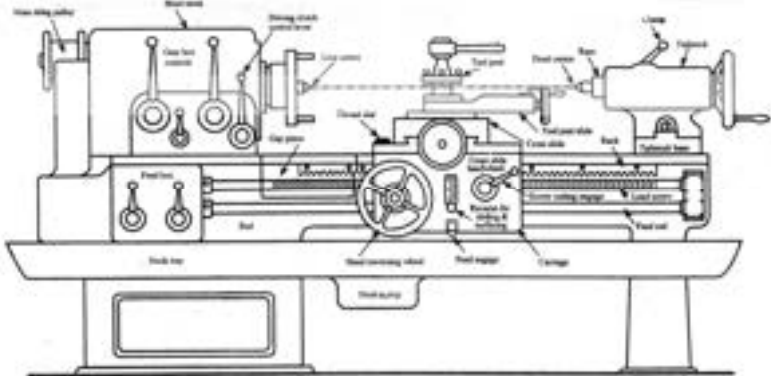


Qn. Nos.	Value Points	Total
	<p>ii) <u>Compression stroke</u></p>  <p style="text-align: center;">Compression Stroke</p> <ul style="list-style-type: none"> • During this stroke piston is moving from B.D.C. to T.D.C. • Both the valves are closed • Pure air inside the engine cylinder is get compressed • Compression ratio 16 : 1 to 20 : 1 • At the end of the stroke, overcompressed hot air diesel is injected from the fuel injector. <p>iii) <u>Power stroke (Working stroke) :</u></p> 	

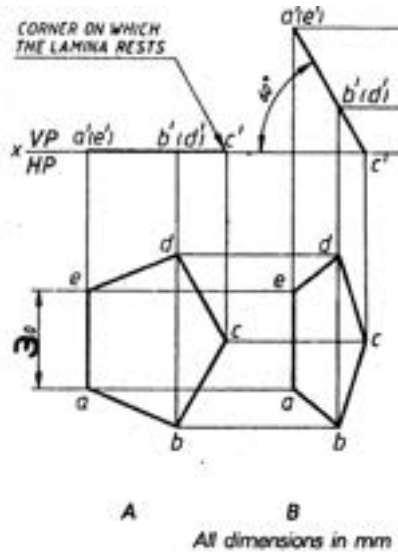
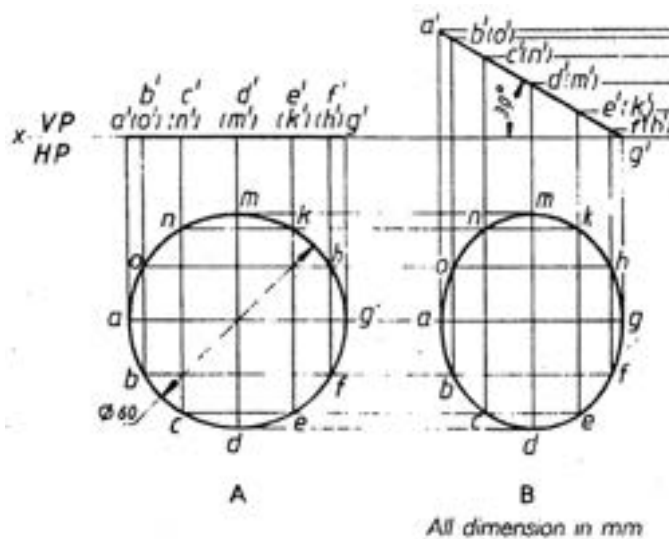


Qn. Nos.	Value Points	Total
	<ul style="list-style-type: none"> • During this stroke piston is moving from T.D.C. to B.D.C. • Both the valves are closed • The high pressure burnt gases forces the piston to perform this stroke • Hence the power is released. <p>iv) <u>Exhaust stroke</u></p>  <ul style="list-style-type: none"> • During this stroke piston is moving from B.D.C. to T.D.C. • Inlet valve is closed and outlet valve is opened • Through outlet valve exhaust gas or smoke is expelled out as on piston moves towards T.D.C. 	5
13. a)	<p>List the different types of operation carried out on lathe.</p> <p>Ans.</p> <ul style="list-style-type: none"> i) Turning ii) Thread cutting iii) Facing iv) Knurling 	2

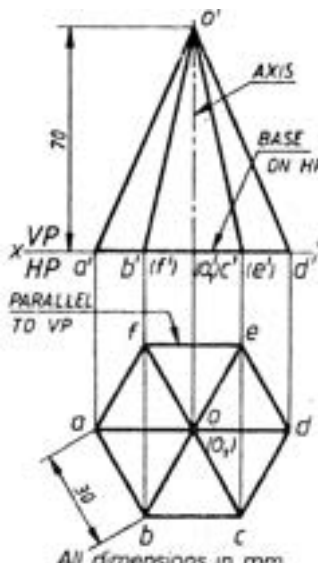
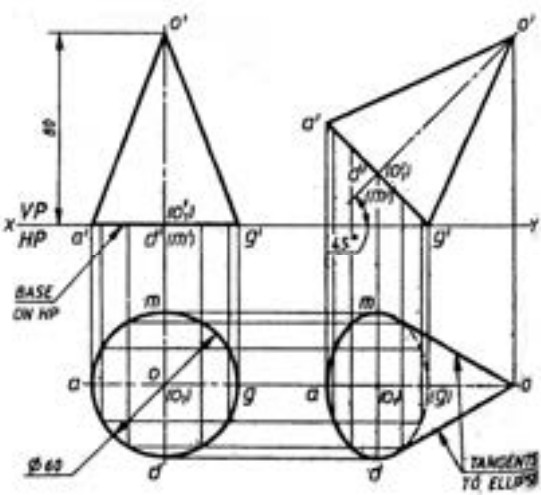


Qn. Nos.	Value Points	Total
<p>b)</p> <p>Explain turning operation on lathe.</p> <p><i>Ans.</i></p> <p><u>Turning operation :</u></p> <p>It is the process of removal of excess metal from the work piece to form a cylindrical surface. The various types of turning are</p> <ol style="list-style-type: none"> i) Straight turning ii) Rough turning iii) Smooth or finishing turning iv) Shoulder turning <p>c)</p> <p>Mention the different types of drilling machines.</p> <p><i>Ans.</i></p> <p>Following are the different types of drilling machine :</p> <ol style="list-style-type: none"> i) Portable drilling machine ii) Sensitive drilling machine iii) Upright drilling machine iv) Radial drilling machine v) Gang drilling machine vi) Multiple spindle drilling machine vii) Automatic drilling machine viii) Deep hole drilling machine. 		<p>3</p> <p>5</p>
<p>14. a)</p> <p>Draw a neat sketch of lathe and label the parts.</p> <p><i>Ans.</i></p>		<p>5</p>



Qn. Nos.	Value Points	Total
<p>b)</p>	<p>A pentagonal lamina of edges 30 mm is resting on H.P. with one of its corners touching it such that the plane surface makes an angle of 60° with H.P. Draw its top and front views.</p> <p>Ans.</p> 	<p>5</p>
<p>15. a)</p>	<p>A circular lamina of 60 mm diameter rests on H.P. such that the surface of the lamina is inclined at 30° to H.P. Draw its top and front views.</p> <p>Ans.</p> 	<p>5</p>

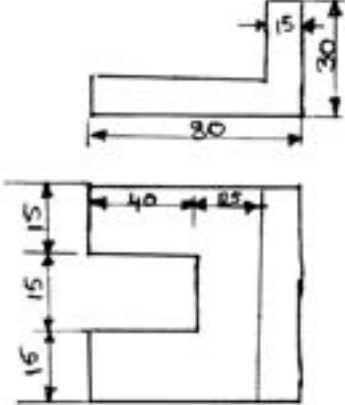
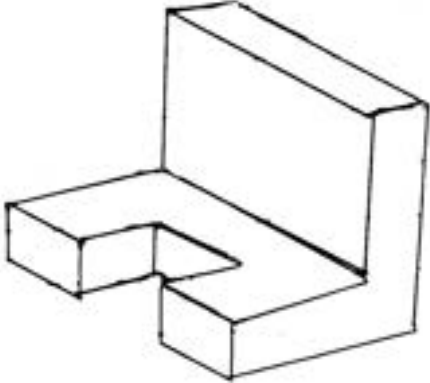


Qn. Nos.	Value Points	Total
b)	<p>Draw the top and front views of a hexagonal pyramid of 30 mm side of base and height 70 mm resting with its base on H.P. such that one of the base edges is parallel to V.P. and nearer to it.</p> <p>Ans.</p> 	5
16.	<p>Draw the top and front views of a cone of 60 mm diameter of base and axis 80 mm long lying on H.P. with its axis inclined at 45° to it and parallel to V.P.</p> <p>Ans.</p> 	10



Qn. Nos.	Value Points	Total
17.	<p>The pictorial view of an object is shown in Figure No. 1. Draw the following orthographic views and mark the dimensions :</p> <p>i) Front view — Looking in the direction of arrow 'X'</p> <p>ii) Top view — Looking in the direction of arrow 'Z'</p> <p>iii) Side view — Looking in the direction of arrow 'Y'.</p> <div data-bbox="491 741 1034 1211" data-label="Image"> </div> <p data-bbox="678 1256 868 1290" style="text-align: center;">Figure No. 1</p> <p data-bbox="379 1328 443 1361"><i>Ans.</i></p> <div data-bbox="491 1397 1054 1845" data-label="Image"> </div> <p data-bbox="751 1895 799 1928" style="text-align: center;">OR</p>	10



Qn. Nos.	Value Points	Total
	<p data-bbox="375 322 1174 405">Draw the isometric view of an object from the given orthographic views in Figure No. 2.</p>  <p data-bbox="678 869 869 902">Figure No. 2</p> <p data-bbox="379 902 446 936"><i>Ans.</i></p>  <p data-bbox="670 1395 877 1429">Isometric view</p>	10

