

Time - 3 Hrs.

D1G
EME&EM

Full Marks : 80

Pass Marks : 26

Answer from both groups separately and in sequence as per direction given in each case in own words.

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All question of Q.No.1 of each Group-A and B are compulsory.

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The figures in right hand margin indicate full marks.

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GROUP-A [Mechanical Portion]

1.(A) Select correct alternative of each of the following :- **1x5=5**

Answer from both groups separately and in sequence as per direction given in each case in own words.

(i) Flux commonly used in brazing is

(a) Zinc chloride

(b) Ammonium chloride

- (c) Resin mixed with alcohol
(d) borax.

çftax ea iz çr çlyDI ~ I k/kkj .kr; k gkrk gS&

- (a) ftad Dykj kbM
(b) vekfu; e Dykj kbM
(c) vYdkgy fefJr jftu
(d) çkjDI A

(ii) Intensive property of a thermodynamic system is

- (a) dependent upon mass
(b) independent of mass
(c) dependent upon energy
(d) dependent upon both mass and energy.

Å"ekxfrd fudk; ea I çku xqk/keZ gkrk gS&

- (a) nð; eku ij fuHkj
(b) nð; eku I sLora=
(c) Åtkz ij fuHkj
(d) nð; eku vçj Åtkz nksuka ij fuHkj A

(iii) Function of an 'Economizer' in a boiler is :

- (a) to make the boiler cheaper
(b) to use the steam again and again
(c) to utilize heat of flue gases
(d) all of the above.

, d ç; kyj ea bdkukerkbtj çk çk; Z gkrk gS&

- (a) bl sl Lrk cukusea
(b) çkjçkj ok"i çk iz kx djusea
(c) çkez ekxZ dh xç ka dh Å"ek çk iz kx djusea
(d) mijkçr I Hkh ea

(iv) Guages are used to :

- (a) measure length
(b) measure angular distance
(c) check dimensional accuracy
(d) all of the above.

^xst* dk iz lxx gkrk gS&

- (a) yEckbz eki us ea
- (b) dks kh; njh eki us ea
- (c) vk; ke dh ; FkkFkrk tkpus ea
- (d) mi jkDr l Hkh eA

(v) Reciprocating motion of piston is converted to rotary motion by :

- (a) piston and crank mechanism
- (b) cylinder and piston mechanism
- (c) flywheel and crank mechanism
- (d) connecting rod and crank mechanism.

fi LVu dh i 'pkxxfr dks ?kwkhz xfr eacnyk tkrk gS&

- (a) fi LVu vks Ød ; æ j puk }kjk
- (b) fl fyUMj , oafi LVu ; æ&j puk }kjk
- (c) flywheel and crank mechanism
- (d) connecting rod and crank mechanism.

(B) Write True for correct statement and False for wrong statement : 1x5=5

I R; dFku dsfy, I R; , oa vl R; dsfy, vl R; fy [ka &

(i) 2-stroke engine has two power strokes in one revolution of crank.

f }&i zkr bat u ea Ød ds, d i fj Hke . k eanks' k fDr i zkr gkrh gA

(ii) Primary function of mountings on a boiler is to provide safe working of the boiler.

, d C; kyj ea ^ekmfUVx* dk i zku dk; Zml sl j f {kr <æ l s dk; Z dj kuk gkrk gA

(iii) Crowning of a pulley is done to prevent a belt on it from running off the pulley.

f?kjuh dk Økmfuæ ml i j p<+i VVs dks f?kjuh NkMUs l s jkdus eagrkrk gA

(iv) Forge welding is basically a fusion welding.

QkstZ ofVMæ cfu; knh : i l s f; ut u ofVMæ gA

- (v) Welding of steel using oxidising flame increases the strength of steel.

वर्द्धन हेतु ऑक्सीकरण प्रयोग के द्वारा लोहा की शक्ति बढ़ती है।

2. Answer any two questions : 5x2=10

किसी दो प्रश्नों का उत्तर दें।

- (a) Differentiate a 2-stroke and a 4-stroke engine.

दो-चक्र और चार-चक्र इंजन में अंतर बताएं।

- (b) What are the selection criteria of gear, belt and chain drive? Explain in brief.

गियर, बेल्ट और चेन ड्राइव का चयन करने के लिए किन-किन मानकों का ध्यान रखना चाहिए? संक्षेप में समझाएं।

- (c) Classify boilers and name some of them.

बोयलरों को वर्गीकृत करें और उनमें से कुछ नाम बताएं।

- (d) Write differences between soldering and brazing.

सोल्डरिंग और ब्राजिंग में अंतर लिखें।

3. Answer any two questions : 10x2=20

किसी दो प्रश्नों का उत्तर दें।

- (a) What are the different type of flames used in welding by oxy-acetylene gas ? Explain them with uses.

ऑक्सी-एसीलीन गैस द्वारा वेल्डिंग में किन-किन प्रकार के फ्लेम का उपयोग किया जाता है? उनके उपयोगों को समझाएं।

- (b) Describe with neat sketch a micrometer. What are its applications ?

सूक्ष्ममापी का संक्षेप में चित्र बनाकर उसका उपयोग समझाएं।

- (c) Define welding. Explain arc welding on the basis of types of electrodes.

वेल्डिंग की परिभाषा दें। विद्युत्-वेल्डिंग को विभिन्न प्रकार के इलेक्ट्रोडों के आधार पर समझाएं।

ofVMx dks i fjHkkf"kr djA byDVMM+ ds izdkj ij vkekkfjr
ofVMx dk o.kU djA

- (d) Describe with P-V diagram the working of a 4-stroke Diesel engine.

prqkkz Mhty batu dh dk; Bizkkyh dk nkc vk; ru
vkj[k l fgr o.kU djA

GROUP-B [Engineering Material]

1. Select correct alternative of each of the following :- **1x10=10**

I gh fodYi dk p; u djA%

- (i) The rocks which are formed from molten magma are called :
- (a) sedimentary rocks
- (b) Igneous rocks
- (c) Metamorphic rocks
- (d) stratified rock.

fi Nysgg eSek l scuh pVVkua dgykrih gS%

- (a) vol knh ; k ryNVh pVVkua
- (b) vkXuS pVVkua
- (c) dk; kUrfjr pVVkua
- (d) Lrjh; pVVkua

- (ii) The size of modular bricks is :

- (a) 22.5 cm x 10 cm x 8.5 cm
- (b) 19 cm x 9 cm x 9 cm
- (c) 22.5 cm x 9 cm x 8 cm
- (d) None of the above.

ekMyj bV dk vkdkj gsrk gS&

- (a) 22.5 cm x 10 cm x 8.5 cm
- (b) 19 cm x 9 cm x 9 cm
- (c) 22.5 cm x 9 cm x 8 cm
- (d) mi jkDr ea l s dkbZ ughA

(iii) The main ingredient of a good quality brick earth is:

- (a) magnesia
- (b) alumina
- (c) silica
- (d) All of the above.

vPNh bV cukusokyh enk dk eq; vo; o gS%

- (a) eSfl ; k
- (b) , yfeuk
- (c) fl fydk
- (d) mi jkDr I HkhA

(iv) The property by virtue of which lime sets under water is known as :

- (a) slacking
- (b) bulking
- (c) hydraulicity
- (d) calcining.

pus dk og xqk ftl ds dkj .k og i kuh dh ekst n xh ea
tedj dBkj gk tkrk g\$ ml s tkuk tkrk gS%

- (a) cP-kuk
- (b) Qnyuk
- (c) tyh; xqk
- (d) QpdukA

(v) Ordinary portland cement achieves about 70%
its final strength in :

- (a) 21 days
- (b) 28 days
- (c) 14 days
- (d) None of these.

I k/kj .k i k/zyM I heV vi uh vfire 'kfDr dk 70% i klr
dj yrh gS%

- (a) 21 fnuka ea
- (b) 28 fnuka ea
- (c) 14 fnuka ea
- (d) buea l s dkbZ ughA

(vi) Knots in timber is caused by defects due to :

- (a) fungi
- (b) insects
- (c) natural forces
- (d) Seasoning.

ydMh ea xkP nksk fuEu ds dkj .k gkrk gS%

- (a) QutkbZ
- (b) dhMg
- (c) i kdfrd cy
- (d) i dkukA

(vii) The commonly used the base of oil paints is :

- (a) red lead
- (b) iron oxide
- (c) White lead
- (d) Whiting.

rsy okys i d/ka ea i k ; % vk/kkj dk mi ; ks fd ; k tkrk gS%

- (a) yky I hl k
- (b) ykq vkDI kbM

(c) I Qn I hl k

(d) 0gkbfVxkA

(viii) The percentage of carbon in wrought iron is :

- (a) 2 to 3.5% (b) 0 to 0.25%
- (c) 0.5 to 0.7% (d) 0.15 to 1.5%

fi Volq ykgs ea dkcu dh ek=k gkrh gS%

- (a) 2 to 3.5%
- (b) 0 to 0.25%
- (c) 0.5 to 0.7%
- (d) 0.15 to 1.5%

(ix) Brass is an alloy of :

- (a) copper, zinc and minor percentage of other element.
- (b) copper, tin and minor percentage of other element.
- (c) copper, nickel and minor percentage of other element.
- (d) none of these.

ihry ,d fefJr /kkrgs&

- (a) rkck] tLrk rFkk vU; rRo dk FkkMk i fr'kr
- (b) rkck] fVu rFkk vU; rRo dk FkkMk i fr'kr
- (c) rkck] fudsy rFkk vU; rRo dk FkkMk i fr'kr
- (d) buea l s dkbZ ughA

(x) Rubber is a of heat.

- (a) good conductor
- (b) bad conductor
- (c) (a) and (b) both
- (d) none of these.

jcj rki dk , d gA

- (a) vPNk pkyd
- (b) d pkyd
- (c) (a) rFkk (b) nksuka
- (d) buea l s dkbZ ughA

2. Answer **any two** questions :

5x2=10

fdlghanks i z uka ds mUkj na %

(a) What are the main classification of rocks ?

pVVku dsef; oxhdj .k dksu&dksu l sgA

(b) Why is frog provided in the brick ?

bV/ ea Ykk D; kafn; k tkrk gS

(c) Compare the merits and demerits of quick lime and slaked lime.

vucq>k puuk rFkk cq>k puuk ds xqkkoxqk dh ryuk djA

(d) What is the difference between cast iron and wrought iron ?

<yok; ykgk rFkk fi Vok ykgk ea vlrj D; k gS

3. Answer **any two** questions of the following :

10x2=20

fuEukfdr ea l s fdlghanks i z uka ds mUkj na %

(a) Describe in detail the working system of a 'bug mill' giving a neat sketch.

P.T.O.

^cx ehv* dk , d l kQ fp= cukdj bl dh dk; & i z kkyh
dk o.ku djA

- (b) Discuss the methods adopted for preservation of timber.

ydMh dsl j {k.k grqvi uk; h tkusokyh fof/k; ka dk o.ku
djA

- (c) What is an alloy ? Discuss various copper alloys.

fefJr /kkrqD; k gS \ rkck ds fofHkuu fefJr /kkrq/ka dk
o.ku djA

- (d) What are the main ingredients of oil paints ?
Describe the working of each component.

ry i v dseq; ?kVd D; k gS \ i R; d ?kVd ds dk; Z dk
o.ku djA

