WWW.SARKARIRESULT.COM

03. यदि प्रवेश पत्र प्राप्त करने में कोई समस्या आती है तो आयोग अथवा **mponline** से संपर्क करें।

04. यदि किसी आवेदक का नाम नॉमिनल रोल में सम्मिलित नहीं है परंतु उसे प्रवेश पत्र प्राप्त हो चुका है तो वह केन्द्राध्यक्ष से मिलकर अपना प्रवेश पत्र प्रस्तुत करें। केन्द्राध्यक्ष संतुष्ट होने पर उसे उसी केन्द्र पर परीक्षा में सम्मिलित करेंगे।

05. अत्यंत महत्वपूर्ण : आवेदक कृपया ध्यान रखें कि परीक्षा केन्द्र पर प्रवेश पत्र के साथ निम्न मान्य फोटो युक्त पहचान प्रमाण पत्र प्रस्तुत करने एवं उससे आवेदक के पहचान की पुष्टि होने के पश्चात ही परीक्षा देने की अनुमति मिलेगी :-

1. पासपोर्ट
2. मतदाता पहचान पत्र
3. ड्रायविंग लायसेंस
4. पैन कार्ड
5. आधार कार्ड
6. शासकीय सेवक के मामले में नियोक्ता द्वारा जारी परिचय पत्र
7. बैंक अथवा पोस्ट ऑफिस की फोटोयुक्त पासबुक
8. शैक्षणिक संस्थान द्वारा अधिकतम तीन वर्ष पूर्व तक जारी परिचय पत्र

परीक्षाओं में सफल आवेदकों को साक्षात्कार के समय भी फोटोयुक्त पहचान पत्र की मूल प्रति तथा एक स्वप्रमाणित छायाप्रति लेकर साक्षात्कार हेतु उपस्थित होना है। **फोटो परिचय पत्र द्वारा आवेदक की पहचान की पुष्टि न होने पर आवेदक को साक्षात्कार देने की अनुमति प्रदान नहीं की जायेगी।**

06. आयोग द्वारा अंतिम चयन सूची जारी किये जाने के पश्चात परीक्षा तथा साक्षात्कार की संयुक्त अंक सूची आवेदकों को ऑनलाइन उपलब्ध करायी जायेगी। आयोग द्वारा मान्य पहचान चिन्ह एवं अनुचित साधन प्रयोग करने वाले आवेदकों की परीक्षा निरस्त की जाएगी। अतः ऐसे आवेदकों की अंक सूची ऑनलाइन उपलब्ध नहीं करायी जायेगी।

07. विज्ञापित पदों का अग्रमान्यता पत्रक साक्षात्कार के समय आवेदकों से प्राप्त किया जाता है तथा इसी अग्रमान्यता पत्रक के अनुसार गुणानुक्रम में आवेदकों का चयन किया जाता है। आवेदकों द्वारा अग्रमान्यता पत्रक प्रस्तुत करने के पश्चात उसमें परिवर्तन/संशोधन करने की अनुमति नहीं दी जाएगी और न ही इस संबंध में कोई अभ्यावेदन मान्य किया जाएगा।

08. निःशक्त श्रेणी के आवेदक अनुप्रमाणन फार्म एवं अभिलेखों के लिफाफे पर **निःशक्त अभ्यर्थी** स्पष्ट उल्लेख करें।

8- परीक्षा की पश्चातवर्ती प्रक्रिया के संदर्भ में आवश्यक निर्देश :-

(अ) राज्य अभियांत्रिकी सेवा (प्रारम्भिक) परीक्षा

01. **राज्य अभियांत्रिकी सेवा (प्रारम्भिक) परीक्षा** का परिणाम केवल 'रोजगार और निर्माण' समाचार पत्र तथा आयोग की वेबसाइट **www.mppsc.nic.in** तथा **www.mppsc.com** पर प्रकाशित किया जायेगा तथा आवेदकों को उनके द्वारा ऑनलाइन आवेदन पत्र में उल्लेखित **E-mail Address** तथा **Mobile Number** पर **E-mail** तथा **SMS Alert** द्वारा सूचित किया जाएगा। आवेदक को उसके परिणाम की सूचना अन्य किसी भी रीति से नहीं दी जायेगी तथा न ही इस संदर्भ में कोई अभ्यावेदन मान्य किया जायेगा।

02. प्रारम्भिक परीक्षा के परीक्षा परिणाम के साथ ही मुख्य परीक्षा के संदर्भ में समस्त आवश्यक सूचनायें प्रकाशित की जायेंगी। अतः सफल आवेदक उनके परीक्षा परिणाम के साथ ही मुख्य परीक्षा से संबंधित समस्त सूचनाओं का ध्यानपूर्वक अध्ययन कर उसमें प्रदत्त अनुदेशों के अनुरूप मुख्य परीक्षा का आवेदन पत्र, प्रारम्भिक परीक्षा परिणाम में उल्लेखित मुख्य परीक्षा हेतु आवेदन करने की अंतिम तिथि तक जमा करें।

03. मुख्य परीक्षा हेतु निर्धारित अंतिम तिथि तक मुख्य परीक्षा का आवेदन जमा न करने पर आवेदक की उम्मीदवारी समाप्त हो जायेगी तथा आयोग द्वारा इस संदर्भ में आवेदक को पृथक से कोई सूचना नहीं दी जायेगी तथा इस संदर्भ में प्राप्त अभ्यावेदनों को बिना विचार किये नस्तीबद्ध किया जायेगा।

राज्य अभियांत्रिकी सेवा (मुख्य) परीक्षा

01. **राज्य अभियांत्रिकी सेवा (मुख्य) परीक्षा** का परिणाम केवल "रोजगार और निर्माण" समाचार पत्र तथा आयोग की वेबसाइट **www.mppsc.nic.in, www.mppsc.com** पर प्रकाशित किया जायेगा तथा आवेदकों को उनके द्वारा ऑनलाइन आवेदन पत्र में उल्लेखित E-mail Address तथा Mobile Number पर E-mail तथा SMS Alert द्वारा सूचित किया जाएगा। आवेदक को उसके परीक्षा परिणाम की सूचना अन्य किसी भी रीति से नहीं दी जायेगी तथा न ही इस संदर्भ में कोई अभ्यावेदन मान्य किया जायेगा।

02. **राज्य अभियांत्रिकी सेवा (मुख्य) परीक्षा** के परीक्षा परिणाम के साथ ही साक्षात्कार के संदर्भ में समस्त आवश्यक सूचनायें प्रकाशित की जायेंगी। अतः सफल आवेदक उनके परीक्षा परिणाम के साथ ही साक्षात्कार से संबंधित समस्त सूचनाओं का ध्यानपूर्वक अध्ययन कर उसमें प्रदत्त अनुदेशों के अनुरूप आयोग की वेबसाइट **www.mppsc.nic.in, www.mppsc.com** पर उपलब्ध कराये गये अनुप्रमाणन पत्रक, व्यक्तिगत विवरण पत्रक एवं उपस्थिति पत्रक डाउनलोड करके आवश्यक पूर्तियों के पश्चात एवं सभी आवश्यक सत्यापित अभिलेख संलग्न कर, मुख्य परीक्षा परिणाम में उल्लेखित साक्षात्कार हेतु अभिलेख जमा करने हेतु निर्धारित अंतिम तिथि तक आयोग कार्यालय में जमा करें। साक्षात्कार के समय आवेदन पत्र में दी गयी योग्यता, उम्र, जाति एवं अन्य जानकारियों से संबंधित प्रमाण-पत्र के साथ मूल प्रमाण-पत्र भी प्रस्तुत करना अनिवार्य है।

03. साक्षात्कार हेतु अभिलेख जमा करने की निर्धारित अंतिम तिथि तक अभिलेख जमा न करने पर आवेदक की उम्मीदवारी समाप्त हो जायेगी तथा आयोग द्वारा इस संदर्भ में आवेदक को पृथक से कोई सूचना नहीं दी जायेगी तथा इस संदर्भ में प्राप्त अभ्यावेदनों को बिना विचार किये नस्तीबद्ध किया जायेगा।

9- यात्रा व्यय का भुगतान :-

1. मध्य प्रदेश हेतु अधिसूचित अनुसूचित जाति, अनुसूचित जनजाति तथा अन्य पिछड़ा वर्ग के ऐसे आवेदकों को जो कहीं सेवारत नहीं हैं को मध्य प्रदेश शासन के प्रचलित नियमों के अधीन आवेदक द्वारा ऑनलाइन आवेदन पत्र में उल्लेखित उसके वर्तमान पते से उसे आवंटित परीक्षा शहर केन्द्र तक के यात्रा व्यय का नगद भुगतान वापसी यात्रा के पूर्व लिखित परीक्षा हेतु केन्द्राध्यक्ष तथा साक्षात्कार हेतु आयोग कार्यालय द्वारा किया जायेगा। आवेदकों को इसके लिये वांछित घोषणापत्र भरकर देना होगा तथा यात्रा भत्ते की पात्रता से संबन्धित निम्न अभिलेख प्रस्तुत करना होंगे :-

   (01) अनुसूचित जाति, अनुसूचित जनजाति तथा अन्य पिछड़ा वर्ग के प्रमाणन हेतु अनुविभागीय अधिकारी (राजस्व) द्वारा जारी स्थायी जाति प्रमाण-पत्र की स्वप्रमाणित प्रति।

   (03) यात्रा टिकट जिसमें यात्रा की तिथि, कहां से कहां तक यात्रा की गयी है तथा किराये की राशि का स्पष्टतः उल्लेख हो।

2. साक्षात्कार हेतु उपस्थित होने वाले अभ्यर्थियों को यात्रा व्यय का भुगतान उक्त नियमों के अनुसार आयोग द्वारा किया जाएगा।

सचिव

परिशिष्ट-3

मध्यप्रदेश लोक सेवा आयोग
राज्य अभियांत्रिकी सेवा परीक्षा
परीक्षा योजना

(क) सेवा में सम्मिलित पद :- राज्य अभियांत्रिकी सेवा में सम्मिलित पदों का विवरण निम्नानुसार है :-

क्र.	पद का नाम	अनिवार्य शैक्षणिक अर्हता	संबंधित अभियांत्रिकी विषय
1.	सहायक यंत्री (सिविल), लोक निर्माण विभाग	बी.ई. (सिविल)	Civil Engineering
2.	सहायक यंत्री (सिविल), जल संसाधन विभाग		
3.	सहायक यंत्री (सिविल), लोक स्वास्थ्य यांत्रिकी विभाग		
4.	सहायक यंत्री (सिविल), पंचायत एवं ग्रामीण विकास विभाग		
5.	सहायक यंत्री (विद्युत), लोक निर्माण विभाग	बी.ई. (इलेक्ट्रिकल)	Electrical Engineering
6.	सहायक यंत्री (विद्युत), पंचायत एवं ग्रामीण विकास विभाग		
7.	सहायक यंत्री (विद्युत), जल संसाधन विभाग		
8.	सहायक यंत्री (यांत्रिकी), लोक स्वास्थ्य यांत्रिकी विभाग	बी.ई. (मेकेनिकल)	Mechanical Engineering
9.	सहायक यंत्री (यांत्रिकी), जल संसाधन विभाग		
10.	सहायक यंत्री (कृषि), किसान कल्याण तथा कृषि विकास विभाग	बी.ई. (कृषि)	Agriculture Engineering

चयन के स्तर :- चयन के निम्नानुसार तीन स्तर होंगे :-

(अ) प्रारम्भिक परीक्षा - 500 अंक (छानबीन परीक्षा)
(ब) मुख्य परीक्षा - 600 अंक
(स) साक्षात्कार - 75 अंक

(अ) प्रारम्भिक परीक्षा :-

प्रारम्भिक परीक्षा ऑनलाइन पद्धति से आयोजित की जायेगी। प्रारम्भिक परीक्षा के प्रश्न-पत्र तथा अंक विवरण निम्नानुसार है :-

				अंक
प्रथम प्रश्न-पत्र	**सामान्य अभियोग्यता** (प्रत्येक प्रश्न 2 अंक)			**200**
	खंड-अ	भारत का सामान्य अध्ययन, मध्यप्रदेश के विशेष संदर्भ में	100	
	खंड-ब	हिन्दी भाषा	50	
	खंड-स	English Language	50	
द्वितीय प्रश्न-पत्र	**संबंधित अभियांत्रिकी विषय** (प्रत्येक प्रश्न 3 अंक)			**300**
	ऑनलाइन प्रारम्भिक परीक्षा के कुल अंक			**500**

प्रश्न-पत्र योजना :

1. दोनों प्रश्न-पत्र वस्तुनिष्ठ (बहुविकल्प) प्रकार के होंगे। प्रत्येक प्रश्न के 4 विकल्प (A, B, C, D) होंगे। अभ्यर्थी को सही उत्तर का चयन करना होगा।
2. प्रथम प्रश्न-पत्र सामान्य अभियोग्यता का होगा जिसमें दो खंड होंगे। खंड (अ) "भारत का सामान्य अध्ययन, मध्यप्रदेश के विशेष संदर्भ में" से 2-2 अंक के कुल 50 प्रश्न होंगे तथा खंड (ब)-1- "हिन्दी भाषा" से 25 प्रश्न एवं (ब)-2- "English Language" से 25 प्रश्न 2-2 अंक के होंगे।
   इस प्रकार प्रथम प्रश्न-पत्र में कुल 100 प्रश्न होंगे तथा उसका पूर्णांक 200 होगा।
3. द्वितीय प्रश्न-पत्र अभियांत्रिकी विषय का होगा जिसमें 3-3 अंकों के कुल 100 प्रश्न पूछे जायेंगे। इस प्रकार इस प्रश्न-पत्र का पूर्णांक 300 होगा। अभियांत्रिकी विषय के प्रश्न-पत्र में मुख्य परीक्षा हेतु निर्धारित अभियांत्रिकी विषयों के प्रथम तथा द्वितीय प्रश्न-पत्र के पाठ्यक्रम से 50-50 प्रश्न पूछे जायेंगे।
4. प्रत्येक प्रश्न-पत्र की अवधि 2 घंटे की होगी। प्रथम प्रश्न-पत्र का खंड (अ) हिन्दी तथा अंग्रेजी दोनों भाषाओं में होगा, खंड (ब)-1 केवल हिन्दी भाषा में तथा (ब)-2 केवल अंग्रेजी भाषा में होगा। संबंधित अभियांत्रिकी विषय का द्वितीय प्रश्न-पत्र केवल अंग्रेजी भाषा में होगा।

ऑनलाइन प्रारम्भिक परीक्षा के उत्तीर्णांक :

ऑनलाइन प्रारम्भिक परीक्षा में उत्तीर्ण होने हेतु अभ्यर्थी को प्रत्येक प्रश्न-पत्र में 40% अंक प्राप्त करना अनिवार्य होगा। मध्य प्रदेश हेतु अधिसूचित अनुसूचित जाति, अनुसूचित जनजाति, अन्य पिछड़ा वर्ग तथा निःशक्त श्रेणी के ऐसे अभ्यर्थियों को जो मध्य प्रदेश के मूल निवासी हैं, उत्तीर्णांक में 10 प्रतिशत की छूट दी जायेगी तथा उन्हें ऑनलाइन प्रारम्भिक परीक्षा में उत्तीर्ण होने हेतु प्रत्येक प्रश्न-पत्र में न्यूनतम 30% अंक प्राप्त करना अनिवार्य होगा। ऑनलाइन प्रारम्भिक परीक्षा में प्राप्त अंकों के गुणानुक्रम के आधार पर विभिन्न प्रवर्गों से भरी जाने वाली कुल रिक्तियों की संख्या के 15 गुना तथा समान अंक प्राप्त करने वाले अभ्यर्थी मुख्य परीक्षा हेतु अर्ह घोषित किये जायेंगे।

(ब) मुख्य परीक्षा :-

प्रारम्भिक परीक्षा के सफल आवेदकों को मुख्य परीक्षा में प्रवेश दिया जायेगा। मुख्य परीक्षा में संबंधित अभियांत्रिकी विषय के पारम्परिक विवरणात्मक प्रकार के दो प्रश्न पत्र होंगे। प्रत्येक प्रश्न पत्र 300 अंकों का होगा। इस प्रकार मुख्य परीक्षा का पूर्णांक 600 होगा।

मुख्य परीक्षा के उत्तीर्णांक :

मुख्य परीक्षा में उत्तीर्ण होने हेतु अभ्यर्थी को प्रत्येक प्रश्न-पत्र में 40% अंक प्राप्त करना अनिवार्य होगा। मध्य प्रदेश हेतु अधिसूचित अनुसूचित जाति, अनुसूचित जनजाति, अन्य पिछड़ा वर्ग तथा निःशक्त श्रेणी के ऐसे अभ्यर्थियों को जो मध्य प्रदेश के मूल निवासी हैं, उत्तीर्णांक में 10 प्रतिशत की छूट दी जायेगी तथा उन्हें मुख्य परीक्षा में उत्तीर्ण होने हेतु प्रत्येक प्रश्न-पत्र में न्यूनतम 30% अंक प्राप्त करना अनिवार्य होगा। मुख्य परीक्षा में प्राप्त अंकों के गुणानुक्रम के आधार पर विभिन्न प्रवर्गों से भरी जाने वाली कुल रिक्तियों की संख्या के तीन गुना तथा समान अंक प्राप्त करने वाले अभ्यर्थी साक्षात्कार हेतु आमंत्रित किये जायेंगे।

(स) साक्षात्कार :

साक्षात्कार 75 अंकों का होगा। साक्षात्कार हेतु कोई न्यूनतम उत्तीर्णांक निर्धारित नहीं हैं।

चयन विधि :-

अंतिम चयनफल मुख्य परीक्षा तथा साक्षात्कार में कुल प्राप्त अंकों के गुणानुक्रम तथा जो पद एक से अधिक विभाग हेतु विज्ञापित हैं उनके संदर्भ में अभ्यर्थी द्वारा साक्षात्कार के पूर्व प्रस्तुत अग्रमान्यता-पत्रक (जिसमें अभ्यर्थी पद तथा विभाग के संदर्भ में अपनी अग्रमान्यता प्रस्तुत करेगा) के आधार पर घोषित किया जायेगा। **प्रारम्भिक परीक्षा केवल एक छानबीन परीक्षा है अतः प्रारम्भिक परीक्षा में प्राप्त अंकों की अंतिम चयन में कोई भूमिका नहीं होगी।**

WWW.SARKARIRESULT.COM

पाठ्यक्रम
State Engineering Services
Preliminary Examination
प्रथम प्रश्नपत्र
सामान्य अभियोग्यता

खंड - (अ) भारत का सामान्य अध्ययन, मध्यप्रदेश के विशेष संदर्भ में

1. **भूगोल**
मध्यप्रदेश का सामान्य परिचय, क्षेत्र, भूस्वरूप एवं संरचना, भौतिक एवं भौगोलिक क्षेत्र तथा जलवायु।

2. **मध्यप्रदेश के प्राकृतिक संसाधन**
   1. खनिज संपदा
   2. वन संपदा एवं वन जीवन
   3. कृषि एवं पशुपालन : फसलों का क्षेत्रीय वितरण, कृषि का योजनाबद्ध विकास, हरित क्रांति, पशुधन का विकास।
   4. जल संसाधन : सिंचाई का विकास एवं सिंचाई परियोजनाएँ।

3. **मानव संसाधन**
जनसंख्या, जनसंख्या घनत्व, शहरी एवं ग्रामीण जनसंख्या, साक्षरता एवं श्रमशक्ति।

4. **ऊर्जा संसाधन**
इसमें परंपरागत एवं अपरंपरागत ऊर्जा के संसाधन तथा उनके मानवीय जीवन में उपयोग से संबंधित प्रश्न होंगे।

5. **उद्योग**
इसमें प्रदेश के उद्योगों के प्रकार एवं आकार तथा उनके राज्य की अर्थव्यवस्था पर प्रभाव से संबंधित प्रश्न होंगे।

6. **पर्यावरण**
पर्यावरण एवं उनके संरक्षण, प्रदूषण, प्राकृतिक आपदा तथा इनका मानवीय जीवन की गुणवत्ता पर होने वाले प्रभावों से संबंधित प्रश्न होंगे।

7. **योजनाएं एवं मूल्यांकन**
इसमें पंचवर्षीय योजनाओं के अभी तक के विभिन्न पहलुओं, विभिन्न कार्यक्रमों जो शहरी एवं ग्रामीण विकास के संबंध में हों तथा आर्थिक योजनाओं के मूल्यांकन तथा देश के परिप्रेक्ष्य में मध्यप्रदेश की सापेक्षित स्थिति से संबंधित प्रश्न होंगे।

8. **मध्यप्रदेश की प्रशासनिक संरचना**
इसमें मध्यप्रदेश की विभिन्न प्रशासनिक इकाइयों जैसे संभाग, जिला, तहसील एवं विकास खण्डों का आपसी संबंध एवं प्रशासनिक संरचना से संबंधित अभ्यार्थियों के ज्ञान का परीक्षण करना होगा।

9. **ग्रामीण एवं शहरी प्रशासनिक संरचना**
पंचायती राज, नगर पालिका एवं नगर निगम की संरचना एवं प्रशासनिक ढांचे से संबंधित सामान्य ज्ञान के प्रश्न अभ्यार्थियों से पूछे जायेंगे।

10. **खेलकूद**
विविध खेलकूद के लिये संगठन, प्रबंधन एवं सुविधाओं से संबंधित अभ्यार्थियों की जागरूकता का परीक्षण करना होगा। इसमें मध्यप्रदेश के राजकीय पुरस्कारों, व्यक्तित्वों एवं शासकीय तथा अशासकीय संगठनों के योगदान से संबंधित प्रश्न होंगे।

11. **मध्यप्रदेश की संस्कृति, साहित्य, संगीत, नृत्य, कला एवं इतिहास**

1. **संस्कृति**
प्रकृति, प्रकार एवं मुख्य-मुख्य बातें तथा मानव जीवन पर उनके प्रभाव से संबंधित प्रश्न होंगे।

2. **साहित्य**
   1. **प्राचीन** - कालिदास, भर्तहरि, भवभूति व बाणभट्ट।
   2. **मध्यकालीन** - केशव, पद्माकर, भूषण।
   3. **आधुनिक** - पं. माखनलाल चतुर्वेदी, सुभद्राकुमारी चौहान, गजानन माधव "मुक्तिबोध", बालकृष्ण शर्मा "नवीन", भवानीप्रसाद मिश्र, हरिशंकर परसाई, शरद जोशी, मूल्लारामोजी, डॉ. शिवमंगल सिंह सुमन तथा नंद दुलारे बाजपेयी।
   4. **लोक साहित्य** - मध्यप्रदेश की बोलियाँ।

3. **संगीत एवं नृत्य परम्परा**
   1. **संगीत परम्परा** - तानसेन, उस्ताद अलाउदीन खाँ, उस्ताद हाफिज अली खाँ, पंडित किशनराव, शंकर पंडित, राजाभैया पूछवाले, उस्ताद अमीर खाँ, कुमार गंधर्व, महाराज चक्रधरसिंह, पंडित कार्तिकराम।
   2. **नृत्य परम्परा** - लोक संगीत की प्रमुख शैलियां, प्रमुख लोक नृत्य।

4. **कला**
सामान्य प्रवृत्ति के प्रश्नों में भित्ति चित्रकला, लोक चित्रकला, आधुनिक चित्रकला के घराने एवं प्रमुख चित्रकार शामिल होंगे। इसमें प्रमुख लोक कलाओं एवं अन्य विभिन्न रंगमंचों से संबंधित प्रश्न भी होंगे।

5. **प्रमुख अनुसूचित जनजाति**
प्रमुख अनुसूचित जनजातियों के नाम, अभिलक्षण, अधिवास, मुख्य मेले एवं तीज त्योहार तथा सांस्कृतिक संरचना से संबंधित सामान्य ज्ञान के मूल्यांकन के लिये प्रश्न पूछे जायेंगे। इसमें म.प्र. शासन के द्वारा अनुसूचित जनजातियों के उत्थान से संबंधित कार्यक्रमों पर भी प्रश्न होंगे।

6. **संस्कृति के क्षेत्र में म.प्र. शासन के कार्यक्रम**
अभ्यार्थियों से साहित्यिक अकादमियों एवं संस्थानों से संबंधित सामान्य ज्ञान के मूल्यांकन के लिये प्रश्न पूछे जायेंगे। संगीत तथा चित्रकला के विविध घराने से संबंधित तथा संस्कृति मेलों से संबंधित प्रश्न होंगे। साहित्य, संगीत एवं ललितकलाओं में प्रमुख योगदान के लिये शासन द्वारा दिये जाने वाले विभिन्न पुरस्कारों से संबंधित प्रश्न होंगे।

7. **पुरातात्विक विरासत**
प्रमुख ऐतिहासिक, पुरातात्विक एवं पर्यटन स्थानों से संबंधित सामान्य ज्ञान के प्रश्न होंगे।

8. **मध्यप्रदेश की ऐतिहासिक पृष्ठभूमि**
मध्यप्रदेश का गठन, मध्यप्रदेश के प्रमुख राजवंशों एवं शासकों पर प्रश्न होंगे। इसमें स्वतंत्रता आन्दोलन में मध्यप्रदेश के योगदान पर भी प्रश्न होंगे।

Section (A) General Introduction of Madhya Pradesh

1. **Geography**
General Introduction of Madhya Pradesh, area, topography and structure, physical and geographic areas and climate.

2. **Natural Resources of Madhya Pradesh**
Mineral Wealth.
Forest Wealth and Wild Life.
Agriculture and Live stock, Regional distribution of crops, planned development of Agriculture, Green Revolution, Development of Live stock.
Water Resources - Development of Irrigation and Irrigation projects.

3. **Human Resources**
Population, Population Density, Urban and Rural population, Literacy and Labours.

4. **Energy Resources**
Questions will attempt to assess the general awareness of candidates about the conventional and non-conventional sources of energy and their uses in human life.

5. **Industries**
Attempt will be made to assess the general awareness of candidates about the types and size of industries and their impact on state economy.

6. **Environment**
Questions will be related to environment and its protection, pollution, natural climates and their impact on quality of human life.

7. **Planning and Evaluation**
Attempt will be to assess the general awareness of candidates about different aspect of five year plans till date, various programmes of urban and rural development, economic planning and its evaluation and status of Madhya Pradesh in the context of Country.

8. **Administrative Structure of Madhya Pradesh**
Questions will be related to general knowledge of candidates about administrative units - Division, District, Tehsil and Development-Blocks; their relationship and administrative structure.

9. **Rural and Urban Administrative Structure**
Questions will be pertaining to the general knowledge of candidate about organization and administrative structure of Pachayati Raj, Municipality and Municipal corporation.

10. **Games and Sports**
Attempt will be made to assess the awareness of candidates related to organization, management and facilities for different games and sports. The questions will also be related to different State awards, and personalities and contribution of Government and non Government agencies.

11. **Culture, Literature, Music, Dance, Arts and History of Madhya Pradesh**

1. **Culture**
The questions will be related to nature, types their salient features and impact on human life.

2. **Literature**
(1) Ancient - Kalidas, Bharthari, Bhavbhuti, Vanabhatta.
(2) Medieval - Keshav, Padmakar, Bhushan.
(3) Modern - Pandit Makhanlal Chaturvedi, Subhadra Kumari Chauhan, Gajanan Madhav Muktibodh, Balkrishna Sharma "Navin", Bhavani Prasad Mishra, Harishankar Parsai, Sharad Joshi, Mulla Ramoozi, Shiv-Mangal Singh, Suman and Nanddulare Vajpai
(4) Folk Literature/Dialects of Madhya Pradesh. Isuri, Singaji.

3. **Music & Dance Tradition**
(1) **Music Tradition -** Tansen, Ustad Allauddin Khan, Ustad Hafiz Ali Khan, Pandit Krishna Rao, Shankar Pandit, Rajabhaiya Poonchwale, Ustad Amir Khan, Kumar Gandharva, Maharaj Chakradhar Singh Pandit Kartik Ram.
(2) **Dance tradition -** Major styles of folk music, major folk dances.

4. **Arts**
Questions of general nature will be related to characteristics of Rock painting, folk painting, modern painting school and important painters. It will also have questions related to major folk and other theatres.

5. **Major Scheduled Tribes**
It will assess the general awareness of candidates related to names, characteristics, habitats, major fairs and festivals and cultural structure of major scheduled tribes. It will also have questions related to different programmes of State Government for the upliftment of Scheduled Tribes.

6. **Programmes of State Government in the field of Culture**
The questions will attempt to assess general knowledge of the candidate related to literasy academics and institutions. The questions will also be related to different Music and Fine Arts Schools and Cultural festivals. There will be questions awards given by the state for the significant contribution in the field of literature, music and fine arts.

7. **Archaeological Heritage**
The questions of general knowledge will be related to significance and characteristics of major historical, archaeological and tourist places.

8. **Historical perspective of Madhya Pradesh**
The questions will be related to creation of M.P. and important dynasties and rules of M.P., It will also have questions related to contribution of M.P. in freedom movement.

खण्ड (ब) हिन्दी भाषा

- व्याकरण संबंधी वस्तुनिष्ठ प्रश्न जिसमें संज्ञा, सर्वनाम, विशेषण, संधि, समास, कारक, आधारित वस्तुनिष्ठ प्रश्न पूछे जायेंगे।
- वाक्य संरचना, वाक्य के प्रकार, वाक्यगत अशुद्धि, शब्दगत अशुद्धि एवं तत्सम, तद्भव से संबंधित वस्तुनिष्ठ प्रश्न पूछे जायेंगे।
- पारिभाषिक शब्द (प्रशासनिक शब्द), विलोम शब्द, पर्यायवाची शब्द, मुहावरे, कहावतें, प्रारूप लेखन, संक्षेपण आधारित प्रश्न होंगे।
- अपठित गद्यांश से संबंधित 5 वस्तुनिष्ठ प्रश्न पूछे जायेंगे। प्रत्येक प्रश्न 2 अंक का होगा।

WWW.SARKARIRESULT.COM

खण्ड (स) English Language

The syllabus for the examination General English will be as follows-

The objective type question paper will carry maximum 25 marks each question of one mark.

- Applied grammar containing topics like parts of speech vocabulary, Active Passive, Direct and indirect speech, Transformation of sentence.
- Sentence completion questions (fill in the blanks) These will be of the nature of multiple choice questions.
- Questions on reading comprehension (Based on an unseen passage each).

द्वितीय प्रश्नपत्र

अभियांत्रिकी विषय

अभियांत्रिकी विषय के प्रश्न-पत्र में मुख्य परीक्षा हेतु निर्धारित प्रथम तथा द्वितीय प्रश्नपत्र के पाठ्यक्रम से 50-50 प्रश्न पूछे जायेंगे।

MAIN EXAMINATION

CIVIL ENGINEERING (CODE NO. 01)

PAPER - I

1. Structural Analysis

Determinate and Indeterminate Structures, Degrees of Freedom. Static and Kinematic indeterminacy, Principle of Superposition, Virtual Work, Energy theorem, Deflection of Trusses, Redundant Frames.

Analysis of Determinate and Indeterminate Arches, their influence lines.

Rolling loads, influence lines for Determinate Beams and Pin-jointed Frames. Mullar Breslau's Principle and influence lines for Indeterminate Beams and Frames.

Slope Deflection, Moment Distribution and Kani's methods. Column Analogy, Energy Methods for analysis of indeterminate beams and frames. approximate methods for analysis of Rigid Frames.

Matrix Methods of analysis, Stiffness and Flexibility Matrices of Beams. Frames & Trusses, Elements of Plastic analysis.

2. Structural Design

(1) Steel Design

Factors of Safety and Load Factors.

Rivetted and Welded connections of Members, Design of Tension, Compression and Flexural members, built-up beams and Plate Girder Slab and Guesseted Bases for Columns, Design of Roof Trusses. Purling and Coverings, Structural Steel tubes and their connections Industrial and Multi-Storyed Buildings Water tank and supporting tower's design. Plastic Design of Continuous Beams & Frames.

(2) R.C. Design

Working Stress and Limit State methods for design of Rectangular, T and L Beams, Slabs and Columns.

Isolated and Combined footings, Raft Foundations.

Overhead, Resting on ground and Underground Water Tanks.

Design of Bunkers and Silos.

Methods and Systems of Prestressing, Anchorages. Losses in Prestress, Design of Prestressed Concrete Beams.

3. Construction Planning and Management

Detailed estimates, specifications, analysis and rates of various works in civil engineering.

Construction activity, work break down structures, scheduling through CPM and PERT analysis, cost optimization through network construction, Float times, Bar charts, Project control and super-vision, cost reduction measures,

Cost analysis and resource allocation,

Fundamentals of engineering economics, methods of appraisal, present work, annual costs, benefit cost analysis, Types of tenders and contract conditions.

4. Environmenal Engineering

Water Demand – Per capita Demand, Population Estimation methods

Water Quality Criteria for various uses viz. Domestic & Non-Domestic, Irrigation effects & significance of important parameters and permissible concentration as per relevant standards.

Transmission of Water- relative merits & demerits of various pipes viz C.I. G.I. Mild Steel.

A.C. Pressure Pipes. Corrosion of Pipes-types & Methods of control System of distribution & layouts of distribution.

Unit Processes & Operations for Water Treatment viz, Objectives and Design criteria of Sedimentation, Coagulation, Flocculation, Chemical Sedimentation. Filtration (slow sand & rapid sand), Disinfection, Softening.

Quantity & Characterization of Domestic Sewage-significance of B.O.D., C.O.D., D.O., Solids. T.O.C., N.O.D.

Effluent Standards, River Standards.

Sewage System-Design of Sewer & Storm Sewer, Sewage Pumps.

Design of Screens, Grit Chamber.

Design of Primary Sedimentation tank.

Design of Biological Treatment Units viz. Trickling filters, Activated Sludge Treatment and Secondary Sedimentation tank.

Waste Stabilization Ponds- Aerobic, Anaerobic & Facultative Ponds, design criteria and principles.

Sludge Treatment- Digestion & Sludge Disposal.

Septic Tanks-design criteria & working

Self Purification of Streams- oxygen sag curve.

Types of Pollution-Sources & effects of various pollution viz., Water, Air, Land & Noise, Relevant standards.

Rural Sanitation, Solid Waste- collection & disposal.

CIVIL ENGINEERING (CODE NO. 01)

PAPER - II

1. Water Resources Engineering

Water Resources in the Globe, Available Fresh Water. Need for Optimum use of Available water, Schemes for Drinking, Irrigation, Hydro Power, Multipurpose Schemes.

Irrigation - Necessity, Scope, Benefits & Effects.

Methods & Systems of Irrigation, their efficiencies. Water Distribuion & Scheduling techniques.

Crop Water Requirements, Evapotranspiration, Consumptive Use, Duty, Delta, Base Period their relation, Crop Rotation, Quality of Irrigation Water.

Hydrology - Hydrological Cycle, Precipitation – Types, Measurement, Raingauge Network, Analysis of Precipitation Data, Dependability Analysis, Unit Hydrograph, Summation & Synthetic Hydrographs, Design Flood by UH & Frequency Studies.

Ground Water - Class & Availability of Soil Moisture. Aquifers- Confined & Unconfined. Open & Tube Wells, Radial Flow in Wells, Depuit's Theory. Darey's Law, Seepage Analysis using Flow Nets. Yield of Wells, determination.

Storage Scheme - Reservoir Planning, Capacity, Yield, Life. Gravity & Earthen Dams. Forces Acing, Modes of Failure, Stability Criteria, Design. Galleries. Shafts. Joints in Gravity Dams. Foundation Treatment.

Spillways, Types, Design of Ogee & Syphon Spillways. Energy Dissipating Devices, Design of Stilling Basins.

Diversion Schemes - Structures on Pervious Formations, Bligh's & Khosla's Theory, Hydraulic Jump, Design of Vertical Drop Weir & Barrage.

Distribution System - Canals – Classification, Layout, Alignment, Capacity, Design of Canals. Silt Theories, Canal Regulation Structures. Design of Head & Cross Regulators, Canal Falls, Cross Drainage Works, and Outlets, Escapes.

Water Logging - Causes, Effects, Remedial Measures, Losses in Canals, Canal Lining, Types. Advantages, Conjunctive use of Surface & Ground Water.

River Training - Objective & Methods, Concepts of Hydro Power Projects.

2. Transportation Engineering

Railways - Permanent Way, Sleepers, Rail Fastenings, Ballast, Points and Crossings, different types of Turn Outs.

Stations and Yards, Turn Tables, Signals and Interlocking, Level Crossing.

Maintenance of Track, Super-elevation, Creep of Rails, Ruling Gradients, Track Resistance. Tractive Efforts, Curve Resistance.

Highways & Airports - Principles of Highway Planning, Highway Alignments.

Geometrical design, Cross-section. Camber, Super-elevation. Horizontal and Vertical curves. Classification of Roads.

Design and Construction of Flexible and Rigid pavements for Highway and Airfields. Evaluation of Pavement Failure and Strengthening, Drainage of Roads.

Traffic Engineering : Traffic Surveys, Highway Capacity, Intersections, Rotary Design Elements, Signs, Signals and Markings.

Selection of Airport Sites, Windrose Diagram & Runway Orientation. Runway and Taxiway Geometric and Lighting.

Bridge Engineering - Selection of Site, Design Data collection, Hydraulic Design, Scour Depth for Bridge Foundation, Economic Span.

Type of Road and Railway Bridges, Design Loads and Forces, Impact Factor, Indian Loading Standards.

Super Structure & Sub Structure, Abutments, Piers, Wing Walls, Return Approaches.

3. Geotechnical Engineering

Index Properties of Soil, Classification of Soils. Clay Minerals.

Capillary Water, Permeability, Factors Affecting Permeability, Lab and field methods. Permeability of stratified soil deposits.

Seepage Pressure, Quick Sand Condition, Flow Net, its properties & uses.

Stess distributioin in soils, Boussinesq's theory. Newmark's Chart.

Consolidation and Settlement : Terzaghi's theory, Consolidation test. Settlement computiation. Time Settlement cureve.

Compaction tests & their significance, factors affecting compaction.

Shear Strength Parameters, Shear Tests, Mohr Coulomb's failure theory, Skempton's Pore Pressure coefficients.

Earth Pressure at rest, Active and Passive Pressures, Rankine's and Coulomb's theory.

Bearing capacity, Terzaghi's analysis, factors affecting Bearing Capacity, Plate Load Test.

Stability of Slopes, Sweedish Slip Circle method and Bishop's simplified method. Stability Number.

Sub-surface exploration. Methods, sampling, SPT, DCPT and Static Cone Penetration Test, Electrical Resistivity and Seismic method.

Essential features of Foundation, types, design criteria, Rafts.

Pile Foundation, Types of Piles, Pile Capacity, Pile Load Test. Group Action. Static/ Dynamic formulae.

Elements of Machine Foundation, Natural frequency, Amplification and Resonance.

Ground Improvement Techniques, Sand Drains, Soil Stabilization, Geotextiles.

ELECTRICAL ENGINEERING (CODE NO. 02)

PAPER - I

1. Circuit theory

Circuit Components, Network graphs, KCL, KVL, Circuit analysis methods: Nodal analysis, mesh analysis, basic network theorems; transient analysis : RL, RC and RLC Circuits; sinusoidal steady state analysis, resonance, Quality factor, balanced three phase circuit analysis. Frequency domain analysis Laplace's transform, Fourier series (trigonometric & exponential). two port networks and their various parameters; Poles and Zeros driving point & transfer function. Passive filter design theory.

2. Electro Magnetic field Theory and Materials

Electrostatic and Magneto static field Laplace's and Poisson's equations, Boundary value problems and solutions; Maxwell's equation, Electromagnetic wave propagation: Reflection and refraction of plane waves. Poynting vector, wave propagation through dielectrics and conductors. Electrical/electronic behaviour of materials : conductivity; free-electrons and band-theory; intrinsic and extrinsic semi-conductor, p-n junction;

WWW.SARKARIRESULT.COM

solar cells, super-conductivity. Dielectric behaviour of materials : polarization phenomena; piezo-electric phenomena. Magnetic material:, superconductivity.

3. Measurement and Instrumentation

Error analysis, Measurement of current, voltage, power, energy, power factor, resistance, inductance, capacitance and frequency Analysis of Bridges. Electronic measuring instruments: Multimeter, CRO, digital volt meter, frequency counter, Q-meter. transducers, measurements of non-electrical quantities by electrical methods, measurement of displacement, temperature, velocity, pressure, Signal conditioning, Date acquisition system.

4. Analog and Digital Electronics

Characteristics and equivalent Circuits (for small & large signals) of Diode, BJT, JFET and MOSFET Clipping, clamping and rectifier circuits, Biasing and bias stability. Amplifiers : single and multi-stage, differential, operational, feedback and power. Analysis of amplifiers; frequency-response of amplifiers. OPAMP circuits. Filters; sinusoidal oscillators : criterion for oscillation; single-transistor and OPAMP configurations. Function generators and wave-shaping circuits. Power supplies.

Boolean Algebra, Boolean function minimization. Logic gates, Combinatorial Circuits: arithmetic circuits, code converters. multiplexers and decoders, sequential circuit : latches and flip flops, Counters, Shift registers, Comparators, timers, multivibrators, Sample and hold circuits, ADCs and DACs. Semiconductor memories, logic implementation using programmable devices (ROM, PLA etc.)

5. Power Electronics

Semiconductor power devices: diode, transistor, SCR, triac, GTO, MOSFET & IGBT, triggering circuits. Phase Control rectifiers. bridge converters : fully Controlled and half Controlled, principles of choppers and inverters.

6. Signals and Systems

Representation and continuous time and discrete time signals and systems; Linear ime Invariant systems; Convolution, impulse response; time domain analysis of LTI systems based on convolution and differential equations, Fourier transform, Laplace transform, Z transform, transferfunction, sampling of signals, DFT, FFT, processing of analog signals through discrete time systems.

ELECTRICAL ENGINEERING (CODE NO. 02)

PAPER - II

PART - I

1. Control System

Fundamental of control systems, block diagram algebra, Signal flow graph and Mason's gain formulae, Linear Time Invariant Systems; Time domain and frequency response. Proportional, PI and PID Control strategies. Stability analysis; Routh Hurwitz Criterion, Nyquist criterion, Design of lead-lag compensators. State Space models, Controllability and observability. Principles of discrete Control systems.

2. Microprocessors and Microcomputers

8 bit microprocessor 8085 : Architecture, CPU, module design, memory interfacing and I/O, interrupts, PPI 8255.

PART - II

Heavy Currents

1. Electromechanical energy Conversion

Principles of electromechanical energy conversion, Torque and emf in rotating machines, characteristics and performance analysis of DC machines and their starting and speed control. Transformers: Principles of operation and analysis, regulation, Three phase transformer, Three phase induction machines, and sychronous machines: Their characteristics and performance analysis, speed control. Special machines : Stepper motors, Brushless DC motors, switched reluctance motors, permanent magnet motors, Single phased induction motor (FHP motors) : Performance and analysis;

2. Industrial Drives & Utilisation

Basic Concepts of speed control of dc and ac motor drives. Applications of Variable speed drives V/f control, Quadrant operation of drives, Concept of Cycloconverts & Dual Converts fed AC & DC drive.

Rating & characteristic of traction motors, dielectric & induction heating.

3. Power Systems Analysis and control

Performance evaluation of overhead transmission lines and cables, fundamentals of active and reactive power transfer, voltage control and power factor correction, per unit representation, Bus admittance and impedance matrices, Load flow study, Economic operation of power system, Symmetrical components, Analysis of symmetrical and unsymmetrical faults, concept of stability, swing curve and equal area criterion, static VAR systems, basic concepts of HVDC transmission, series and shunt compensation, FACTS. speed control of generators, tie line control and frequency control.

4. Switch gear and protection

Principle of over current, differential and distance protection, concept of solid state relays and circuit brakers various protection scheme for transmission lines, generator and transformer. Protection against surges.

PART - III

Light Current

1. Analog communication

Random variables - continuous, discrete, probability density functions, statistical averages, random signals, and noise, noise equivalent bandwidth, signal transmission with noise, signal to noise ratio, amplitude modulation, DSB, DSB-SC and SSB, modulators and demodulators, phase and frequency modulation, PM and FM signals, narrowband FM, generation and detection of FM and PM.

2. Digital communication

Pulse code modulation (PCM), differential pulse code modulation (DPCM), Delta modulation (DM), Digital modulation and demodulation schemes : Amplitude phase and frequency, keying schemes, (ASK, PSK, FSK), Error control coding, error detection and correction, linear block codes, convolution codes.

3. Satellite Communication, Radar and T

Satellite communication, general overview and technical characteristics earth station equipments, satellite link design, CNR of satellite systems, Radar : basic principles, pulsed systems : CW Doppler radar, FMCW radar, Phase array radar, television systems and standards, colour TV transmission and receiver systems.

4. Microwaves & Antenna

Electromagnetic radiation, Propagation of waves - ground waves, sky wave, space wave, tropospheric scatter propagation. Extraterrestrial communications. Antenna : Various types, gain, resistance, band-width, beam width and polarization, effect of ground. Antenna coupling; high frequency antennas; microwave antennas; special purpose antennas. Microwave Services : Klystron, magnetron, TWT, gun diodes, Impatt, Bipolar and FETs, Microwave integrated circuits. Microwave measurements.

5. Fiber Optic Systems

Multiplexing - Time division multiplexing, frequency division multiplexing, optical properties of materials, refractive index absorption and emission of light, optical fibers lasers and optoelectronic materials, fiber optic links.

MECHANICAL ENGINEERING (CODE NO. 03)

PAPER - I

Note : Use of Design Data Book is permitted.

1. Engineering Mechanics and Mechanics of Solids

Free body Diagram and Equilibrium; Trusses and Frames; Stress and Strains in Two Dimension; Mohr's Construction; Beams – Bending Moment and Shear Force Diagram; Bending and Shear Stress Distribution; Torsion of Shafts; Thin and Thick Walled Pressure Vessels; Euler's Theory of Column. Leaf and Helical springs.

2. Theory of Machines

Displacement, Velocity and Acceleration of Plane Mechanisms (Maximum 6 Links), Kliens' Construction; Law of Gearing, Gear Tooth Profile, Epicyclic Gear Trains; Motion Analysis of Cam and Followers; Balancing of Rotating Masses, Reciprocating Masses– Hammer Blow, Tractive Effort and Swaying Couple; Power Transmission by Belt Drive; Analysis of Simple Band, Block, Band and Block Brakes; Dynamometers; Free Vibrating of Single Degree of Freedom Systems; Whirling of Shafts; Gyroscopic Stability of Shaft, Ship and Aeroplane.

3. Design of Machine Elements

Design Concepts; Theories of Failure; Design for Static and Dynamic Loading, Design of Bolted, Rivetted and Welded Joints; Design of Shaft and Coupling.

4. Production Engineering

Merchant's Force Analysis, Tool Life and Tool Wear; Cutting fluids, Machinability and Machining Economics; Principles of Non-Traditional Machining Processes – EDM, ECM, USM & Laser; Principles of Design of Jigs and Fixtures; Limits, Fits and Tolerances; Comparators ,Gauge Design; Measurement of Surface Roughness; Interferometry; Acceptance Test of Machine Tools.

5. Production Management

Production Planning and Control; Forecasting Models; Aggregate Production Planning; Material Requirement Planning; Inventory Control – ABC Analysis, EOQ Model; Linear Programming – Simplex Method, Transportation & Assignment Model; Simple Queuing Models; PERT & CPM; Quality Control in Manufacturing, Control Charts for Variables & Attributes.

MECHANICAL ENGINEERING (CODE NO. 03)

PAPER - II

Note : Use of Steam Table and Psychometric Chart are permitted.

1. Thermodynamics

Steady Flow Energy Equation; Entropy and Irreversibility; Availability and Available Energy; Detailed Analysis of Thermodynamic Cycles and their Limitations.

2. Fluid Mechanics and Machines

Continuity, Momentum and Energy Equations; Flow net; Turbulent Flow through Pipes; Velocity Distribution in Laminar and Turbulent Flow; Dimensional Analysis; Boundary Layer on a Flat Plate; Adiabatic and Isontropic Flow of Compressible Fluids; Classification of Hydraulic Turbines and Pumps; Specific Speed; Impulse and Reaction Turbines; Velocity Diagrams.

3. Heat Transfer, Refrigeration and Air Conditioning

Critical Thickness of Insulation; Conduction through Walls and Pipes; Heat Transfer from Fins; Dimensionless Numbers; Free and Forced Convection; Heat Exchange by Radiation between black and Gray Surfaces; Electrical Analogy; Heat Exchanger Classification; Effectiveness; LMTD and NTU Methods; Fouling Factor.

Vapour Compression and Vapour Absorption Systems and their Cycle Analysis; Nomenclature, Properties and Characteristics of Important Refrigerants; Ozone Friendly Refrigerants; Human Comfort and ASHRAE Comfort Charts; Estimation of Air-Conditioning Loads.

4. Energy Conversion Systems

Theories of Combustion in Compression Ignition and Spark Ignition Engines; Abnormal Combustion; Carburetion and Fuel Injection; Emissions from Engine and their Control; Modern Trends in IC Engines; Classification of Steam Turbines, Specific Speed, Velocity Triangles; Open and Closed Cycle Gas Turbine Plants; Nuclear Power Plants; Renewable Energy Sources.

5. Computer Aided Engineering

Introduction to CAD, 2D and 3D Drawing Concepts; Computer Aided Manufacturing – NC and CNC Machines, Methods of Part Programming; Elements of Robotics and Automated Material Handling System; FMS and Expert System.

AGRICULTURE ENGINEERING (CODE NO. 04)

PAPER - I

1. Soil and Water engineering :-

Surveying and leveling.

Surveying: Introduction. classification and basic principles, Linear measurements. Chain surveying. Compass survey. Errors in measurements, their elimination and correction. Plane table surveying. Leveling, contouring, Computation of area and volume. Theodolite traversing. Introduction to setting of curves.

2. Soil and Water Conservation Engineering :-

Introduction soil erosion-causes types and agents of soil erosion water erosion forms of water erosion mechanics of erosion gullies and their classification stages of gully development soil loss estimation – universal soil loss equation and modified soil

WWW.SARKARIRESULT.COM

loss equation determination of their various parameters erosion control measures agronomical measures-contour cropping strip cropping. Mulching mechanical measures – terraces- Level and graded broad base terraces and their design. bench terraces & their design. layout procedure terrace planning bunds- contour bunds graded bunds and their design gully and ravine reclamation – principles of gully control vegetative and temporary structures wind erosion – factors affecting wind erosion mechanics of wind erosion. soil loss estimation. wind erosion control measures vegetative mechanical measures wind breaks & shelter belts sand dunes stabilization sedimentation – sedimentation in reservoirs and streams estimation and measurement sediment delivery ratio trap efficiency characteristics of contours and preparation of contour maps, land use capability classification grassed water ways and their design. Introduction to water harvesting technique introduction to stream water quality and pollution.

3. Watershed Hydrology :-

Introduction; hydrologic precipitation – forms, rainfall measurement, mass curve, hydrograph mean rainfall depth, frequency analysis of point rainfall. Plotting position estimation of missing data, test for consistency of rainfall records interception infiltration evaporation evaporation evapo transpiration – estimation and measurement geomorphology of watersheds – stream number, stream length stream area stream slop and Horton's laws; runoff factors affecting, measurement; stage and velocity rating curve, extension of rating curve estimation of peak runoff rate and volume rational method. Cooks method, SCS method. Curve number method, hydrograph of different durations dimensionless unit
hydrograph, distribution hydrograph, synthetic unit hydrograph, uses and limitations of unit hydrograph head water flood control- methods retards and their location; flood routing- graphical methods of reservoir flood routing hydrology off dry land areas-drought and its classification to watershed management and planning.

4. Irrigation Engineering :-

Irrigation Engineering: Irrigation impact of irrigation on Human Environment some major and medium irrigation schemes of India, purpose of irrigation, sources of irrigation water present status of development and utilization of different water resources of the country; Measurement of irrigation water weir notches flumes and orifices and other methods; water conveyance design of irrigation field channels underground pipe conveyance system irrigation structures channel lining land grading different design methods and estimation of earth work and cost classification of crops. crops rotation cropping and mixed cropping agronomical practices for different field crops. Soil water plant relationship. Soil water, movement. Infiltration evapoltranspiration. soil moisture constants depth of irrigation frequency of irrigation, irrigation efficiencies; surface irrigation methods of water application, border check basin, furrow and contour irrigation sprinkler and drip irrigation method merits demerits selection and design participatory irrigation management Economics of water resources utilization.

5. Groundwater, Wells and Pumps :-

Occurrence and movement of ground water aquifer and its types, classification of wells, steady and transient flow into partially, fully and non- penetrating and open well, familiarization of various types of bore wells common in the state design of open well groundwater exploration techniques methods of drilling of well, percussion rotary reverse rotary design of assembly and gravel pack installation of well screen completion and development of well. Theis recovery method well interference multiple well systems, surface and subsurface exploitation and estimation of ground water potential quality of ground water artificial groundwater recharge planning , modeling ground water project formulation. Pumping Systems. Water lifting devices different types of pumping machinery classification of umps component parts of centrifugal pumps performance curves, effect of speed on head capacity power capacity and efficiency curves, effect of change of impeller on performance characteristics.

6. Soil and water Conservation Structures :-

Introductions; classifications of structures, functional requirements of Soil erosion control structures; flow in open channels-types of flow state of regimes of flow energy and momentum principles, specific force; hydraulic jump and its application, type of hydraulic jump, energy dissipation due to jump, jump efficiency relative loss of energy; runoff measurig structures par shall fulme, H-fulme and weirs straight drop spillway-general description use advantages and disadvantages, structural parts and functions; components of spillway, hydrologic and hydraulic design, free board and wave free board, aeration of weirs, concept of free and submerged flow, structural design of ad drop spillway-loads o on headwall, variables affecting equivalent fluid pressure determination of saturation line for different flow conditions, seepage under the structure equivalent fluid pressure of triangular load diagram for various flow conditions, creep ling theory, uplift pressure estimation, safety against sliding, over turning crushing and tension chute general description and its components, hydraulic design energy dissipaters, design criteria of a SAF stilling basin and its limitations, drop inlet spillway-general description, functional use design criteria design of diversions; small earth embankments-their types and Design principles, farm ponds and reservoirs, cost estimation of structures.

7. Drainage Engineering :-

Drainage objectives of drainage, familiarization with the drainage problems of the state Surface drainage, drainage coefficient, types of surface drainage, design of open channel, sub-surface drainage purpose and benefits, investigations of design parameters hydraulic conductivity drainable porosity water table etc. types and use of subsurface drainage system, Design of surface of surface drains, interceptor and relief drains derivation of ellipse (Hooghoudt's) and Ernst's drain spacing equations Design of subsurface drainage system. Drainage materials, drainage pipes, drain envelope Layout, construction and installation of drains Drainage structures. vertical drainage Bio-drainage. Tile Drains, Drainage of irrigated and humid areas. Salt balance, reclamation of saline and alkaline soils, Leaching requirements, conjunctive use of fresh and saline waters. Economic aspects of drainage.

8. Micro Irrigation Systems Design :-

Past, present and future need of micro-irrigation systems. Types and components of micro-irrigation system, Micro-irrigation system- design, design synthesis, installation, and maintenance. Sprinkler irrigation- types, planning factors, uniformity and efficiency, laying pipeline, hydraulic lateral, sub-mains and main line design, pump and power unit selection Drip irrigation- potential, automation, crops suitability.

9. Watershed Planning and Management :-

Watershed management - problems and prospects; watershed based land use planning watershed characteristics – physical and geomorphologic, factors affecting watershed management hydrologic data for watershed planning, watershed delineation, delineation of priority watershed, water yield assessment and measurement from a watershed; hydrologic and hydraulic design of earthen embankments and diversion structures; sediment yield estimation and measurement from a watershed and sediment yield models; rainwater conservation technologies- in situ and storage, design of water harvesing tanks and ponds; water budgeting in a watershed; effect of cropping system, land management and cultural practices on watershed hydrology, evaluation and monitoring of watershed programmers; people's participation in watershed management programmers'; planning and formulation of project proposal; cost benefits analysis of watershed programmers'; optimal land use models case studies.

10. Minor Irrigation and Command Area Development :-

Major, medium and minor irrigation project- their comparative performance; development and utilization of water resources through different minor irrigation schemes. Basic concepts of command area – definition need scope, and development approaches; command area development authorities Interaction/collaboration of irrigation water use efficiency and agricultural production. Use of remote sensing techniques for command area development. Farmers participation in command area development.

AGRICULTURE ENGINEERING (CODE NO. 04)
PAPER - II

1. Farm power & Technology :-

Workshop Technology – Introductions of different workshop tools, shaping. drilling, milling and welding machines their applications and constructional features, Properties of materials.

2. Farm Machinery & Equipment :-

Objectives of farm mechanization. Classification of farm machines, Materials of construction & heat treatment, Principles of operation and selection of machines used for production of crops. Field capacities & economics. Tillage; primary and secondary tillage equipment. Forces acting on tillage tools. hitching systems and controls. Draft measurement of tillage equipment : Earth moving equipment - their construction & working principles viz Bulldozer, Trencher, Elevators etc. sowing planting & transplanting equipment – their calibration and adjustments. Fertilizer application equipment. Weed control and Plant protection equipment- sprayers and dusters, their calibration, selection, constructional features of different components and adjustments.

Principles & types of cutting mechanisms. Construction & adjustment of shear & impact-type cutting mechanisms. Crop harvesting machinery, movers windrowers, reapers, reaper binders and forage harvesters, Forage chopping & handling equipment. Threshing mechanics & various types of threshers, Threshers, straw combines & grain combines. maize harvesting & shelling equipment. Root crop harvesting equipment potato, groundnut etc. Principles of fruit harvesting tools and machines.

3. Farm Power :-

Sources of farm power-conventional & non conventional energy sources. Classification of tractors and IC engines. Review of thermodynamic principles of IC (CI & SI) engines and deviation from ideal cycle. Study of engine components their construction. operating principles and functions. Engine systems; valves & valve mechanism. Fuel & air supply, cooling. lubricating. Ignition starting and electrical systems. Study of constructional details, adjustments & operating principles of these systems. IC engine fuels- their properties & combustion of fuels, gasoline tests and their significance, diesel fuel tests and their significance. detonation and knocking in IC engines, study of properties of coolants,
anti freeze and anti corrosion materials, lubricant types & study of their properties. Engine governing systems.

4. Field Operation & Maintenance of Tractor & Farm Machinery:-

Introduction to tractor maintenance procedure and trouble shooting. Scheduled maintenance after 10, 50, 100, 250, 500 and 1000hrs. of operation. Safety hints. Top and overhauling. Fuel saving tips Preparing the tractor for storage. Care and maintenance procedure of agricultural machinery during operation and off-season. Repair and maintenance and workshop requirements.

5. Tractor Systems and Controls :-

Study of transmission systems, clutch, gear box differential and final drive mechanism. Familiarization of brake mechanism. Ackerman and hydraulic steering and hydraulic systems. Tractor power outlets: P.T.O. belt pulley, drawbar, etc. Tractor chassis mechanics and design for tractor stability. Ergonomic consideration and operational safety.

6. Farm Power & Machinery Management :-

The role of mechanization and its relationship to productivity, employment, social and technological change, performance and power analysis; cost analysis of machinery fixed cost and variable costs, effect of inflation on cost; selection of optimum machinery and replacement criteria; Break-even analysis reliability and case flow problems, mechanization planning; case studies of agricultural mechanization in India.

7. Renewable Energy Sources :-

Classification of energy sources; Introduction to renewable energy sources characterization of biomass; types, construction working principle, uses and safety environmental aspects of different renewable energy devices like gasifies biogas plants, solar passive heating devices photovoltaic cell and arrays; Brief introduction to wind energy hydroelectric energy, ocean energy, briquetting and baling of biomass, biomass combustion, biodiesel preparation and energy conservation in agriculture.

8. Human Engineering Safety :-

Human factors in system development – concept of systems; basic processes in

(शेष अगले पृष्ठ पर)

WWW.SARKARIRESULT.COM

(पिछले पृष्ठ का शेष)

system development, performance reliability, human performance, Information input process, visual displays, major types and use of displays, auditory and factual displays, Speech communications, Biomechanics of motion, type of movements, Range of movements, strength and endurance, speech and accuracy, human control of systems. Human motor activities, controls, tools and related devices. Anthropometry; arrangement and utilization of work space, atmospheric conditions, heat exchange process and performance, air pollution.

Dangerous machine (Regulation) act. Rehabilitation and compensation to accident victims. Safety gadgets for spraying, threshing, Chaff cutting and tractor & trailer operation etc.

9. Design and Maintenance of Greenhouse :-

History and types of greenhouse. importance. function and features of green house. scope and development of green house technology Location. Planning and various component of greenhouse; design criteria and calculation; constructional material and methods of construction; covering materials and its characteristics, solar heat transfer, solar fraction for green house, steady state analysis of green house. Greenhouse heating cooling shedding and ventilation systems; Carbon dioxide generation an monitoring and lighting systems, instrumentation & computerized environmental Control systems. Watering, fertilization root substrate and its pasteurization, containers and benches, plant nutrition. alternative cropping systems; plant tissue culture, chemical growth regulation; disease control integrated pest management; postproduction quality and handing cost analysis of greenhouse production; Applications of green house & its repair & maintenance.

10. Post Harvest Engineering and others :-

Engineering Properties of Biological Materials & Food Quality

Importance of engineering properties of biological materials, Study of different physical and thermal characteristics of important materials like shape, size, volume, density roundness sphericity surface area, specific heat, thermal conductivity. thermal diffusivity, etc. measurement of colour, flavour consistency, viscosity, texture and their relationship with food quality and composition. Rheological characteristics like stress. strain time effects. rheological models and their equations. Aerodynamic characteristics and frictional properties. Application of engineering properties in handling processing machines and storage structures. Concept objectives and need of quality, quality control, methods of quality, sampling purpose sampling techniques requirements and sampling procedures for liquid, powdered and granular materials sensory quality control, panel selection methods, interpretation of sensory results in statistical quality control. TQM and TQM, consumer preferences and acceptance. Food Laws and Regulations in India. Food grades and standards BIS, AGMARK, PFA. FPO, CAC (Codex Alimantarious Commission) sanitation in food industry, GMP, HACCP (Hazard analysis and critical control point) and ISO 9000 Series.

11. Crop Process Engineering :-

Scope and importance of food processing, principles and methods of food processing. Processing of farm crops cereals, pulses oil seeds fruits and vegetables and their products for food and feed Processing of animal products. Principal of size reduction, grain shape, size reduction machines, crushers, grinders, cutting machines etc. operation, efficiency and power requirement–Rittinger's, Kick's, and Bonds equation fineness modulus. Theory of mixing types of mixtures for dry and paste materials, rate of mixing and power requirement, mixing index. Theory of separation, size and un sized separation, types of separators, size of screens, sieve analysis capacity and effectiveness of screens pneumatic separation. Theory of filtration study of different types of filters, rate of filtration pressure drop during filtration. Scope & importance of material handing devices. study of different types of material handling. systems; belt chain and screw conveyor bucket elevator, pneumatic conveying, gravity conveyor-design consideration, capacity and power requirement.

12. Drying and Storage Engineering :-

Moisture content and methods for determination, importance of EMC and methods of its determination, EMC curve and EMC model, principle of drying, theory of diffusion, mechanism of drying- falling rate. constant rate. thin layer deep bed and their analysis, critical moisture content, drying models, calculation of drying air temperature and air flow rate. air pressure within the grain bed. Shred's and Hukill's curve different methods of drying including puff drying foam mat drying. Freeze drying etc. Study of different types of dryers- performance. energy utilization pattern and efficiency study of drying and dehydration of agricultural products. Types and causes of spoilage in storage. conditions for storage of perishable product functional requirement of storage. control of temperature and relative humidities inside storage, calculation of refrigeration load; modified atmospheric storage and control of its environment, air movement inside the storage, storage of grains destructive agents, respiration of grains, moisture and temperature changes in stored grains, conditioning of environment inside storage through natural ventilation, mechanical ventilation, artificial drying, grain storage structures such as Bukhari, Morai, Kothar silo, CAP warehouse – design and control of environment. Storage of cereal grains and their products, storage of seed, hermetically sealed and air-cooled storages-refrigerated, controlled atmosphere modified atmospheric and frozen storages. Storage condition for various fruits and vegetables under cold and CA storage system. Economic, aspects of storage.

G-22517/30514/2014