



G .S. Mandal's
MAHARASHTRA INSTITUTE OF TECHNOLOGY,
AURANGABAD
(An Autonomous Institute)

Name of the Examination: End Semester Examination Seyond Year B.Tech. (Civil Engineering)
- Feb/Mar-2023

Name of the Course : Building Planning & Design

Course Code : CED203

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S.No.	Sub Q.No.		Marks
1	a	Pointing is the implementing of joints to a depth of 10 mm to 20 mm and filling it with better quality mortar in desired shape. Plastering is a building material used for the protective or decorative coating of walls and ceilings and for moulding and casting decorative elements. And the process of covering surfaces with Plaster is called Plastering.	2 Marks
	b	State any two uses of Gypsum in building construction. Building gypsum is used as heating resistant, moisture preserving, sound absorbing and fire proofing material. As a building decorative material, it is widely used in ceiling and partition projects.	2 Marks
	c	Enlist any two types of stone masonry. The two main classifications of Stone Masonry are: Rubble Masonry. Ashlar Masonry.	2 Marks
	d	Brick masonry is defined as the placement of bricks in a systematic manner using mortar to bind the bricks together and create a solid mass that can withstand a great deal of pressure.	2 Marks
	e	Define floor area ratio. The floor area ratio is the relationship between a building's total usable floor area and the total area of the lot on which the building stands.	2 Marks
	f	Grouping in building planning means setting different rooms of a building according to their inter-relationship of invitation and transition. The rooms arranged in the layout in a proper correlation of their functions and in due proximity with each other. Roominess is obtained by getting the maximum benefit from the minimum dimension of a room without cramping the plan. By	2 Marks

		using every nook and corner of the building advantage roominess is derived.	
	g	A line usually set with respect to the frontage of a plot of land which is fixed by statute or by deed or contract and beyond which the owner of the land may not build. Control line means a line on either side of a highway or part of a highway beyond the building line fixed in respect of such highway.	2 Marks
	h	A two point perspective is a linear perspective in which parallel lines along the width and depth of an object are represented as meeting at two separate points on the horizon that are 90 degrees apart as measured from the common intersection of the lines of projection.	2 Marks
2		<p>Explain the surface finishing building materials in detail.</p> <p>Surface finishing materials are paints, varnishes, distempers and white/colour washing. The surfaces may be plastered wall surfaces, ceilings, wooden surfaces, metallic surfaces, etc. These surface finishing materials have to provide a hygienic surface and present a healthy surrounding to live in.</p> <p>Paints are primarily used for woods, walls and ceilings, and for metal works of windows. Varnishes are preferred for woodworks and sometimes for walls.</p> <p>Paints are mixture of pigments and binders generally available in liquid state. Different types of paints and their applications in construction is discussed. Paints form a solid film when applied on a surface. This film protects the surface from many dangers like corrosion, weathering, chemical attacks etc. Timber or metal structures can extend their life by coating them with paints. Not only protection paints also provides aesthetic appearances to the surfaces. So, paints play a major role in construction works and projects.</p> <p>Classification of Paints and their Applications</p> <p>All paints are not suitable for all conditions. For different conditions, different types of paints may be useful. The different types of paints and their applications in construction are explained below.</p> <p>Different Types of Paints</p> <p>Following are the different types of paints:</p> <ul style="list-style-type: none"> Aluminum paints Asbestos paints Anti-corrosive paints Bituminous paints Cement based paints Synthetic rubber paints Silicate paints Graphite paints Plastic paints 	2 Marks

	<p>Casein paints Cellulose paints Enamel paints Emulsion paints Bronze paints Colloidal paints Oil paints Aluminum Paints</p> <p>Aluminum paints are made by mixing finely ground aluminum with spirit or oil varnishes. Spirit varnish makes the drying period shorter and oil varnish imparts slow drying facility. So, varnish can be used according to the requirement. This type of paint is used for painting wood works, metallic surface etc. The layer of paint is hardened by evaporation of spirit or oil. Aluminum paint has many advantages such as, it is waterproof, resistance against electricity, corrosion, weathering, it can be visible in dark and provides good appearance.</p> <p>Varnish</p> <p>Varnish is a solution of resin in either oil, turpentine or alcohol. It dries after applying, leaving a hard, transparent and glossy film of resin over the varnished surface.</p> <p>Varnish is applied (1) to the painted surface to increase its brilliance and to protect it from the atmospheric action and (2) to the unpainted wooden surface with a view to brighten the ornamental appearance of the grains of wood.</p> <p>Composition of Varnishes: The ingredients of varnish are:</p> <p>Resins Solvents Driers</p> <p>(i) Resins</p> <p>Commonly used resins are copal mastic, amber gum and lac. Quantity of varnish depends much upon the quality of resin used. Copal is considered to be the best, toughest, hardest and is very durable for external work.</p> <p>(ii) Solvents Ornamental appearance of the grains of wood.</p> <p>These must suit the resins used. Boiled linseed oil is used to dissolve copal or amber, turpentine oil for common resin or mastic, methylated spirit for lac. Wood naphtha, because of its offensive smell is not suited for superior works and is used only for cheap</p>	6 Marks
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varnish.

(iii) Driers

These should be added only in small quantities as an excessive injures varnish and impairs its durability. Litharge or lead acetate are the commonly used driers in varnish added to accelerate drying process.

Different kinds of Varnishes:

Based on the different solvents used, varnishes are classified under the following categories:

Oil Varnish

Turpentine Varnish

Spirit Varnish

Water Varnish

Varnishing: Clean and dry surface of wood work is given a coat of thin and clear hot solution of glue to which a little brown earth and ochre is added if the wood is of oily nature and the varnish does not dry on it. It is rubbed down smooth and is second coat of thin clean glue with necessary quantity of burnt sienna is applied. It is rubbed with fine sand paper and a coat of varnish is then applied to the surface. Second coat of varnish should be applied when the first one has dried and rubbed down smooth with sand paper.

White Wash And Colour Washing

White washing and colour washing of surfaces of building is necessary on both hygienic and aesthetic reasons. In order to obtain a clean, neat and uniform finish, it is necessary to adopt proper method for both preparation of surface to receive white wash or colour wash and for application of white wash or colour wash.

Preparation of White Wash

White wash is prepared from fat lime. The lime is slaked at the site and mixed and stirred with about five liters of water for 1 kg of unslaked lime to make a thin cream. This should be allowed to stand for a period of 24 hours, and then should be screened through a clean coarse cloth. One kg of gum is dissolved in hot water may also be added for every 10 kg of lime. Sometimes, rice is used in the place of gum. The application of sodium chloride (common salt) to lime-wash helps in quick carbonation of calcium hydroxide making the coating hard and rub-resistant. Small quantity of ultramarine blue (up to 3 gm per kg of lime) may be added to the last two coats of white wash solution.

Preparation of Surface

	<p>The new surface should be thoroughly cleaned off all dirt, dust mortar drops and other foreign matter before white wash is to be applied. Old surfaces already white-washed or colour-washed should be broomed to remove all dust and dirt. All loose scales of lime wash and other foreign matter should be removed. Where heavy scaling has taken place, the entire surface should be scraped clean, any growth of moulds moss should be removed by scrapping with steel scraper and ammonical copper solution consisting of 15 gm of copper carbonate dissolved in 60 ml of liquor ammonia in 500 ml of water, should be applied to the surface and allowed to dry thoroughly before applying white or colour wash.</p> <p>Application of White Wash</p> <p>White wash is applied with moonj or other brush, to the specified number of coats (generally three). The operation in each coat should consist of a stroke of the brush given from top down-wards, another from the bottom upwards over the first before it dries. Each coat should be allowed to dry before the next coat is applied. The white washing on ceiling should be down prior to that on walls.</p> <p>Colour Washing</p> <p>Colour washing is prepared by adding colouring pigment to the screened white wash. Generally used pigments are yellow earth red ochre and blue vitriol. These are crushed to powder, before mixing. The colour wash is applied in the same fashion as the white wash. For colour washing on new surface, the first primary coat should be of white wash and the subsequent coats should be of colour wash.</p>	
3	<p>UPVC Doors</p> <p>The number of people opting for Unplasticized Polyvinyl Chloride (UPVC) has shot up in the recent years due to its unprecedented strings of advantages over the other types of doors and These are one of the most durable types of doors and windows out there and require the least maintenance. UPVC Doors will ensure your safety and security as well since it's pretty hard to break them open. They are also well known for their sound and heat insulation capabilities. Find the best uPVC door manufacturers and uPVC window manufacturers at WFM and request a quote for your requirements.</p> <p>Aluminium Doors</p> <p>The aluminium doors and windows are one of the most common ones that you will get to see. They can be painted according to your choice and come in a variety of surface finishes to meet your requirements. They are pretty sleek and will occupy very less space in your house. The maintenance costs are also low for these types of doors.</p>	4 Marks

	<p>Wooden Doors These are the traditional types of doors and windows available in most houses. These frames are not affected by temperature. You will be able to choose from a number of woodwork and designs. If done right, it will impart an exquisite and royal look to the house. There will be no issue with rusting of the frames. If you need a long-lasting solution for wooden doors, you might opt for timber which requires the least maintenance and is guaranteed to serve for a long.</p> <p>Steel Doors These types of doors can withstand heavy exteriors They need relatively less maintenance when compared to wooden doors and windows. Steel doors can be easily repaired. They are best suited for exterior-facing locations.</p> <p>Aluminium Windows These are one of the most common materials used for windows. These windows can be painted according to one's wish and require very less maintenance. They are pretty slim and thus will not eat up much of your space. Aluminium windows have been used for a long time now and are still ruling the market. You can also get a variety of finished done on the frames such as solid, matte or glossy.</p> <p>Wooden Windows Yes, they do sound old, but there's a reason these windows have survived this long and are still a choice for many. These windows impart an elegant look to the house. They require comparatively higher maintenance but balance out on the royal touch they impart to the house. You can get a hand-sculpted frame or fittings for your wooden windows which are sure to awe everybody visiting your home.</p> <p>uPVC Windows These are the new-generation materials that have taken the market by storm. uPVC Windows are considered to be eco-friendly materials. They are highly thermally efficient and thus can help you in cutting down the costs of heating or cooling your home. They are also fire resistant and thus provide you with an added layer of safety. They are also known to be pretty good insulators and keep the outside noise at bay. These are one of the most affordable types of windows.</p> <p>Steel Windows It is needless to say that these are one of the strongest and most durable types of windows that are very secure. Gone are the days when one used to worry about rusting in the case of steel windows. Now there are galvanized steel windows that do not rust over decades and have the same strength as their predecessor. You will also be able to choose from a wide range of designs to meet the look of your house.</p> <p>Bay Windows –Medieval and Baroque touch These windows are projected outward the main building wall and</p>	<p>4 Marks</p>
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	<p>form a cozy bay that can be polygonal, half-square, semicircular, semi-hexagonal and sometimes even triangular.</p> <p>Box Bay –Mostly used in kitchens, in interior plantation areas, or just for ornamentation</p> <p>Bow Window –curved window offering a wide view of the outside</p> <p>Circle Bay –Gothic-styled circular window used for dining space, in the bedroom and living room</p> <p>Oriel Window –Cost-effective and large-sized and offers a panoramic view far away.</p> <p>(Relevant diagrams are also expected)</p>	
4	<p>Analyze the types and use of varnishes.</p> <p>Varnish</p> <p>Varnish is a solution of resin in either oil, turpentine or alcohol. It dries after applying, leaving a hard, transparent and glossy film of resin over the varnished surface.</p> <p>Varnish is applied (1) to the painted surface to increase its brilliance and to protect it from the atmospheric action and (2) to the unpainted wooden surface with a view to brighten the ornamental appearance of the grains of wood.</p> <p>Composition of Varnishes: The ingredients of varnish are:</p> <p>Resins Solvents Driers</p> <p>(i) Resins</p> <p>Commonly used resins are copal mastic, amber gum and lac. Quantity of varnish depends much upon the quality of resin used. Copal is considered to be the best, toughest, hardest and is very durable for external work.</p> <p>(ii) Solvents</p> <p>These must suit the resins used. Boiled linseed oil is used to dissolve copal or amber, turpentine oil for common resin or mastic, methylated spirit for lac. Wood naphtha, because of its offensive smell is not suited for superior works and is used only for cheap varnish.</p> <p>(iii) Driers</p> <p>These should be added only in small quantities as an excessive injures varnish and impairs its durability. Litharge or lead acetate are the commonly used driers in varnish added to accelerate drying process.</p>	8 Marks

THE QUALITIES OF GOOD VARNISH

It should be dry quickly

On drying it should form a hard, tough and durable film.

It should have good weathering properties, resist abrasion and wear well.

It should be able to retain its colour and shine.

It should be uniform and pleasant looking on drying.

Different kinds of Varnishes:

Based on the different solvents used, varnishes are classified under the following categories:

Oil Varnish

These are made by dissolving hard resins like amber or copal in oil. They are slow to dry but are hardest and most durable of all varnishes. They are suited for being used on exposed surfaces requiring polishing or frequent cleaning and for superior works.

Turpentine Varnish

These are made from soft resins like mastic, common resin is dissolved in turpentine oil.

Spirit Varnish

Varnishes in which spirit is used as a solvent as known as spirited varnish or French Polish. Shellac is dissolved in spirit and the product is applied in a thin layer. This varnish gives a transparent finish thus showing the grains of the timber. These however, do not weather well and as such are used for polishing wood work not exposed to weather.

Water Varnish

They consist of lac dissolved in hot water with borax, ammonia, potash or soda just enough to dissolve the lac. Varnish so made withstands washing. It is used for painting wall paper and for delicate work.

VARNISHING

Clean and dry surface of wood work is given a coat of thin and clear hot solution of glue to which a little brown earth and ochre is added if the wood is of oily nature and the varnish does not dry on it. It is rubbed down smooth and a second coat of thin clean glue with necessary quantity of burnt sienna is applied. It is rubbed with fine sand paper and a coat of varnish is then applied to the surface. Second coat of varnish should be applied when the first one has dried and rubbed down smooth with sand paper.

French polish or spirit varnish

It is prepared by dissolving pure shellac varying from pale orange to lemon yellow in colour and free from resin or dirt, in methylated spirit at the rate of 0.15 kg of shellac per liter of spirit. It may be coloured by adding some pigments. The solution is then strained through a double thickness of coarse muslin.

It dries quicker and becomes harder and more brilliant than turpentine varnish but cracks and scale off. It does not withstand weathering and is used only for superior wood work not subjected to the vagaries of weather.

Before applying French polish the surface is cleaned of dust. It is then coated with filler made by mixing 250gms of whiting in one liter of methylated spirit. A suitable pigment like burnt sienna or umber if required may be added as otherwise the French polish will get absorbed and a good gloss will be difficult to obtain.

A pad of woolen cloth is wrapped in a fine cloth and used for applying the polish. The pad is moistened with the polish and rubbed hard on the surface to be polished. The polish is used sparingly but uniformly on the surface. Rubbing is done in a series of overlapping circles. A trace of linseed oil on the pad facilitates this operation. Subsequent coats are applied after the previous one has dried. The finishing coat is applied with the pad moistened with methylated spirit and rubbing the surface lightly and quickly to give the surface a uniform texture and high gloss.

Wax Polish

Two parts of bees wax are mixed in two parts of boiled linseed oil over a slow fire. When dissolved, one part of the turpentine oil is added to it. The mixture is rubbed into the pores of wood with cotton pad. On rubbing, wax leaves a dull polish on surface which is far superior, more durable and takes longer to accomplish than the French polish. Rubbing is continued till the desired finish is obtained. Brisk rubbing give bright surface. For good finish, normally three applications are required. Surface to be polished should be absolutely clean.

5	Diagram of a one-point perspective for a single room of size 4m x 5m with labeling	10 M
	Writing detailed procedure of drawing	6 M
	OR	
	Developed plan	4 M
	Elevation	4 M
	Section	3 M
	Site plan	3 M
	Writing the schedule of opening and construction notes with specification of single story frame structure (1-BHK) with staircase.	2 M